THE MEDICAL NEWS.

A WEEKLY JOURNAL OF MEDICAL SCIENCE.

VOL. 82. NEW YORK, SATURDAY, JUNE 13, 1903. NO. 24.

ORIGINAL ARTICLES.

COLCHICUM IN THE TREATMENT OF GOUT.*

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IN these days of advanced chemistry, and pharmacology, when the attention of the therapeutist is being constantly directed to the use of new remedies, and our offices are flooded with samples of them, there is a tendency to overlook the old ones, and to forget for the time their value and the place to which they are rightfully entitled.

It is wholesome, I think, occasionally to take up the study of some of these old remedies, to review their history, and compare the results obtained by the earlier observers with those of our own time to see what if any advances have been made in the methods of their administration, and to learn, if possible, with the added light of our better knowledge of disease, the manner of their action. Thus we may determine if they are really entitled to hold their own or if they may not be properly supplanted by something better and more effectual among the recent creations of the laboratory.

This is my excuse for taking up your attention this evening with a consideration of colchicum and its use in gout.

In the year 580 Alexander of Tralles wrote of the great value of colchicum in arthritic affections, and it was also recommended later by Ægineta, Avicenna, Serapion, and other distinguished Greek and Arabian physicians. So great was the repute in which it was held in these days that it was sometimes called anima articulorum, or the soul of the joints, because they believed it to be "very efficacious in scouring the mucilaginous glands, and preserving them free from the lodgment of such gritty matter as occasions the gout and arthritic complaints."

It was under the name of Hermodactyl that colchicum was known at that time, and there is every reason to suppose that the hermodactyl of the ancients is identical with the hermodactyl brought from oriental countries in modern times, which was regarded by Pereira as having consisted of the corms of some variety of *Colchicum autumnale*, and by others of having been a variety of *Colchicum variegatum*. The hermodactyls have not been subjected to the test of physiological experiment in this country, though from the description of those employed in the treatment of joint affections by Paulus Ægineta it seems that they resembled in their action our ordinary colchicum, for he says, "Some, in the paroxysm of all arthritic disease, have recourse to purging with hermodactylus, but it is to be remarked that the hermodactylus is bad for the stomach, producing nausea and anorexia, and ought therefore to be used only in the case of those who are pressed by urgent business, for it removes rheumatism quickly and after two days at most, so that they are enabled to resume their accustomed employment."

Following this time there seems to have been a considerable period when colchicum was practically unknown as a remedy in gout, and it was not until 1763 that it again received attention as a specific. Sydenham in his classical treatise on gout, written in 1650, does not mention it. Nicholas Culpepper, who published in 1653 a materia medica and treatise on disease, gives 54 different remedies for gout but does not mention colchicum, nor hermodactyl. Stephen Geoffrey, in his lectures before the Royal College in 1709, refers to the hermodactyls and says, "hermodactyl is the bulbous root of a kind of colchicum which is different from the root of the common colchicum in that it remains white when dried" . . . "it is now sometimes mixed with jalap in rheumatism," and in 1720 Hermann Boerhaave in his materia medica speaks of hermodactyl as a "phlegmagogue" and says that it is sometimes used as a cathartic, but is too dangerous for common use.

Colchicum autumnale or meadow saffron, the plant which is in use to-day, was introduced as a medicine by Baron Storck in 1763. Soon after its introduction it became a very popular remedy in all affections of the joints and was used extensively by the physicians of that time. On account of its remarkable effect in relieving pain and in cutting short the acute attacks of gout it was soon taken up by the quacks, and various gout specifics were put upon the market the active ingredient of which was colchicum.

The most celebrated of these specifics was the Eau Medicinale, a preparation employed by M. Husson, a military officer in the service of the King of France. Sir Everard Hone, and other prominent physicians of that time were in the habit of prescribing Eau Medicinale and in their writings commended its use, and it owed its popularity among the laity largely to this fact. It was generally believed, and there is very little doubt that colchicum was the basis of this widely used and most excellent remedy, but of course it was to the interests of the quacks to deny it. Charles Scudamore, an authority on gout, in his book on gout and rheumatism, published in 1819, while extolling the value of colchicum in these affections, said and tried to prove that Eau Medicinale owed its value, not to colchicum but to some other very powerful, and much more dangerous drug.

* Read before the Northwestern Medical and Surgical Society.

After a careful perusal of the chapter devoted to this subject in his book, I am inclined to believe that Scudamore was actuated by a commendable desire to counteract the influence of Sir Everard Hone and those physicians who were in the habit of using and recommending this patent medicine, and to take out of the hands of quacks the treatment of so common a disease as gout. To do this he made an effort to show that the use of such patent preparations as Eau Medicinale, Reynold's specific, and Wilson's specific, which were also very popular at that time, was fraught with great danger. While he, of course, showed that the employment of such remedies in the hands of laymen might be productive of serious results, he failed in proving that they were not using colchicum.

One must not think that the use of colchicum was universally extolled, though the weight of evidence was always decidedly in its favor, for there were those, as there are to-day, who expressed themselves strongly on the ill effects attending the use of the drug.

Dr. Pettit said that it caused gouty attacks to become more frequent and chronic, and Dr. Todd in his clinical lectures, expressed a similar opinion and said that although colchicum shortened the duration of the fits, it also diminished the interval between the attacks and the system got accustomed to its use as it did to opium. Even Paulus Ægineta, to whom I have referred, said of hermodactyl, "it is bad for the stomach, producing nausea and anorexia, and should only be used in the case of those who are pressed by urgent business." Dr. Copeland is perhaps the most rabid of the objectors to colchicum. In his treatise on gout he claims that it produces profound disturbances of various kinds, and goes so far as to say that he has met with instances of hypochondriasis, melancholia, mental delusion amounting to insanity, paralysis and angina pectoris, all arising from the use of colchicum.

Before Storck had the boldness to try the effects of *Colchicum autumnale* on his own person, it was considered a dangerous poison, since then it has often been the subject of experimental study, and its clinical employment has afforded continual opportunities for a discovery of its specific action, but without effect. Our knowledge of it is still purely empirical.

Colchicum autumnale, or meadow saffron, is a small biennial bulbous plant, which grows wild, in moist meadows, in England and other temperate parts of Europe. The corm and seed are the portions used in medicine. They yield their virtues to vinegar and alcohol, and contain in addition to tannic acid, gallic acids, starch, sugar, gum, etc., an amorphous alkaloid colchicine, which is soluble in water, and in alcohol, but insoluble in ether.

The colchicine is undoubtedly the active principle of the drug. Taken internally it depresses the cerebral convolutions and the cord, causing loss of sensibility and of consciousness, and diminished reflex excitability; the peripheral sensory nerves being also paralyzed, while the motor nerves and the muscles are unaffected. The activity of the respiratory system is lowered, so that death occurs by asphyxia, and the heart is weakened, so that the pulse may become intermittent, perhaps as a disturbance secondary to that of the respiration.

In small doses it stimulates the secretion of the liver and renders it watery. In large doses it produces nausea, vomiting and repeated purging, and primary acceleration, followed by a reduction in the frequency of the pulse. In excessive doses it is a gastro-intestinal, irritant poison, inducing violent vomiting, uncontrollable diarrhea and collapse.

There are many and diverse opinions as to its effect upon the kidneys and urinary secretion. Biddle says that it augments the flow of urine and increases the excretion of uric acid and urea. Lewins found the urea almost doubled with its use. Hammond found that it increased the flow of urine and the proportion of solids. Storck relates that the administration was accompanied with the passage of vast quantities of urine. C. S. Taylor claims that in the cases observed by him the urine as well as the amount of uric acid and urea were decidedly increased. Chilius and Maclagan both agree that it acts as a direct diuretic.

On the other hand there are many prominent observers who take just the opposite view. Graves and Gardiner affirm that the uric acid diminishes under its use. Fawcett, in a series of 20 cases, reports that in none of the cases is any definite effect to be noted in increasing the excretion of uric acid, in fact the uric acid distinctly diminishes during the period of administration. Garrod made a series of observations covering a large number of cases, and gives the following conclusions based upon his results: (1) There is no evidence that colchicum produces any of its effects on the system by causing the kidneys to eliminate an increased quantity of uric acid; in fact, when the drug is continued for any length of time, it appears to exert a contrary effect. (2) We cannot assert that colchicum has any influence upon the excretion of urea or other solid ingredients of the urine. (3) Colchicum does not act as a diuretic in all cases on the contrary, it often diminishes the quantity of urine, more especially when it produces a marked effect upon the alimentary canal.

My own observations upon this point are as follows:

Case I.—W. M., male, aged thirty-five years, has suffered from gout for ten years. Has chronic enlargement of the joints of both hands and feet. Has at times acute exacerbations, but none for some months preceding the observations. The total daily excretion of urine was taken for a period of thirty-four days, the patient being throughout the entire period on a constant diet as regards nitrogenous food so that this influence upon the output of uric acid and urea would be eliminated. The methods em-

ployed were the Gowers-Hopkins method for the uric acid and the Kjeldahl method for urea. The results obtained were as follows: Average daily excretion for eleven days *preceding* administration of colchicum: Total amount urine, 2,084 c.c.; specific gravity, 1.016; uric acid, .608 gms.; urea, 28.08 gms.; ratio, 1-53. Average daily excretion for seventeen days *during* administration of colchicum: Total amount urine, 1,681 c.c.; specific gravity, 1.018; uric acid, .674 gms.; urea, 27.24 gms.; ratio, 1-42. Average daily excretion for six days *following* administration of colchicum: Total amount urine, 1,485 c.c.; specific gravity, 1.017; uric acid, .546 gms.; urea, 25.62 gms.; ratio, 1-48.

Case II.—D. H., aged thirty years; had primary attack of gout in big toe of right foot three weeks previously. Has been free for ten days. This observation covered 25 days. Average daily excretion for nine days *preceding* administration of colchicum: Total amount urine, 2,366 c.c.; specific gravity, 1.013; uric acid, .301 gms.; urea, 30.72 gms.; ratio, 1-125. Average daily excretion for six days *during* administration of colchicum: Total amount urine, 1,925 c.c.; specific gravity, 1.015; uric acid, .386 gms.; urea, 32.41 gms.; ratio, 1-86. Average daily excretion for nine days *following* administration of colchicum: Total amount urine, 2,050 c.c.; specific gravity, 1.016; uric acid, .403 gms.; urea, 36.00 gms.; ratio, 1-91.

At first thought it would seem remarkable that different observers could obtain such varying results, and one might naturally conclude that the effect of colchicum upon different individuals was not the same. This idea is probably true to so slight a degree that it does not in any way explain the wide variations. It is much more probable that the explanation lies in the different methods employed, many of them so faulty as to be entirely worthless, and in the want of care exercised in the control of conditions which would materially influence results. For example, Maclagan's observations were made from single specimens of urine taken at different times during the day, without reference to the total quantity excreted during the twenty-four hours. Prof. Chelius made some experiments which showed an enormous increase of uric acid but his observations were made on a subject just recovering from an acute attack of gout, a condition which would entirely vitiate the experiment. The ingestion of food stuffs containing a large amount of nitrogen, or of neuclein-holding foods, would influence to a great degree the excretion of both uric acid and urea, and it is likely that in many of these observations no account of this was taken. The observations made by Fawcett, Garrod and myself were made with due attention to all these details, and the results obtained are practically the same. We may conclude, therefore, that the effect of colchicum upon the urinary secretion is at least not to augment it and in fact, if anything, is rather to diminish it, while the excretion of uric acid and urea under its influence, remains practically the same.

The preparations of colchicum which are most widely used, are the wine of the root, the wine of the seed, the acetate, and the alkaloid colchicine. Among the early writers the wine was the favorite form, given either alone, or combined with carbonate and sulphate of magnesia and some aromatic water, as recommended by Garrod. Scudamore preferred the acetate, being convinced by various observations that he made, that "the acetic acid takes up all its active properties and produces the good effect of which the drug in its other forms is capable, and is not chargeable with any one ill consequence." I think that the favorite preparation in use to-day with the majority of physicians is the wine, though for my part I invariably use the alkaloid colchicine, believing that I get better and more constant results with it, with less danger of the disagreeable consequences which often attend the administration of the other forms; besides which it seems to me to be much more reliable and is certainly far pleasanter to take.

The method of its administration differs among its warmest advocates. Many believe that in order to insure its prompt anodyne and controlling effect in an acute attack, it is necessary to exhibit it in fairly large and frequent doses to the point of active purgation, then diminishing it only so much as to keep up frequent watery stools. A recent text-book on therapeutics advises its administration in this way. I do not think that pushing it to this extent is ever necessary, and thoroughly believe that the ill effect upon the heart and the extreme prostration sometimes seen are entirely due to this cause. I quite agree with Dr. Gardiner, who says in his work on gout, "Colchicum never more effectually relieves the patient than when it acts silently and peacefully without producing any evacuation whatsoever, or in any way disturbing the patient's comfort and ease." When the acuteness of the attack has passed, in the interval between attacks, or, in chronic gout, small doses may be advantageously given and continued for a considerable length of time. From various observations I am convinced that the employment of alterative doses of this kind will not only do much toward relieving the discomfort of chronically affected joints, but will also act decidedly in preventing acute exacerbations. Ewart and others object to a long continued use of the drug because of the danger of establishing a tolerance to it and thus losing its aid when an acute attack supervenes, and Garrod objects to it because of its cumulative action. I must confess to never having seen either of these effects though I have often used it for weeks and months at a time. In the book already referred to the author says that care must be exercised in its use lest retrocedent gout should occur owing to the manifestations of the disease leaving the toe and going to the internal viscera. I have seen gout affect the internal viscera, though rarely, but I believe it is much less likely to occur with its administration than without it. It is held by some that organic diseases of the heart either valvular or degenerative are contraindications to

its use. In the latter, of course, it should be exhibited with caution, as should any other powerful drug, but need not necessarily be withheld, while in valvular disease, provided compensation is not impaired, there is not the slightest objection to its use. Kidney disease is also considered by some a reason to withhold it. My own experience is quite to the contrary. Many of my chronic gout patients are sufferers from nephritis, and I not only do not hesitate to administer colchicum to them, but in many instances I am convinced that the condition of the kidneys is improved thereby. I have observed in a number of cases a marked diminution in the amount of albumin excreted under the influence of the drug. In one case of nephritis I recorded the daily output of albumin, before, during and following the administration of colchicum. The result was as follows: Average daily amount of albumin for three days *before* administration of colchicum: Total amount urine, 2,160 c.c.; specific gravity, 1.010; amount albumin, 11 per cent.; amount, 256 grams. Average daily amount of albumin for seven days *during* administration of colchicum: Total amount urine, 2,234 c.c.; specific gravity, 1.016; amount albumin, 8 per cent.; amount, 178 grams. Average daily amount for four days *after* administration of colchicum: Total amount urine, 1,822 c.c.; specific gravity, 1.017; amount albumin, 9 per cent.; amount, 168.7 grams.

How Does Colchicum Act to Relieve and Cure Gout?—Some have contended that it is by taking out the uric acid from the blood and eliminating by the kidneys. Reliable experiments have shown that there is no increased elimination of uric acid under the influence of colchicum; then too, as a matter of fact, the blood does not contain an excess of uric acid during a gouty paroxysm. Some have suggested that it may act on the nervous system as a sedative, but other drugs sedative in their action have no influence on gout. Others think that it has an elective action on the peculiar structures of the joints implicated in gouty inflammation. The same structures, however, are affected in various other arthritic diseases, notably rheumatism, and it is well known that colchicum has little if any influence in rheumatism. The truth is that so long as we remain in ignorance as to the true nature of gout, we can only speculate as to the modus operandi of the drug, and must be content to employ it empirically, as has been done in the past, with such modifications in its administration as a more careful study of its action and a wider clinical experience with its effects may suggest.

66 West Forty-ninth Street.

Anuria Calculosa Treated with the Permanent Catheter.—A case of anuria occurring in a patient who had repeatedly passed calculi T. CIMINO (Policlin. Sez. prat., April 22, 1903) treated by leaving a permanent catheter within the left ureter in which a calculus of unusual size had become lodged. To a reflex dilatation of the ureter in response to the presence of the catheter the author attributes the release of the calculus and reestablishment of the normal flow of urine.

FOUR MONTHS' EXPERIENCE WITH ANTI-STREPTOCOCCIC SERUM IN PULMONARY TUBERCULOSIS.*

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THE purpose of this paper is to furnish an authentic report of the results of recent observations relative to the influence of an agent, which, several years ago, was used by the writer and discarded as of no practical utility. Its present employment in carefully selected cases of pulmonary tuberculosis is found to be of undoubted value. The particular type of cases in which there is afforded a justification or provisional indication for the use of the serum must be understood to be that class exhibiting well defined clinical evidence, of a secondary or streptococcic infection. This is substantiated by the presence of the streptococci in the sputum and may be suggested by such rational signs as chills, irregular elevations of temperature and sweats with other associated disturbances.

The utter failure of early efforts with the serum as generally reported found a plausible explantation in the recognition of the several varieties of streptococci and the very apparent lack of conformity between the particular type from which the serum was derived, and that present in the individual to whom it was applied. My previous experience with the serum having been uniformly unsatisfactory, it was with considerable hesitation and some scepticism that it was decided to begin the administration of the remedy in a few cases for whom, if to any, its use seemed to be especially appropriate.

At the last meeting of the American Medical Association in Saratoga, my attention was called to the occasional good results now possible to be obtained from the use of this agent, and in conversation with Dr. M. P. Ravenel, the information was conveyed to me that a serum derived from any of the distinct types of streptococci exerted such a predominant influence over all others, that for clinical purposes the difference in the several varieties was a matter of no practical importance. At the same time the failure attending its previous administration was attributed to the extremely light virulence of the micro-organism, and vital errors involved in its early preparation.

Any physician having considerable experience in the management of pulmonary tuberculosis, and constantly brought into intimate association with the disease, cannot fail to be impressed with the great prognostic significance of a pronounced streptococcic infection. There is ever impressed upon the medical attendant the appreciation of the disproportion frequently existing between the physical signs and the general condition of the patient. Many with pronounced physical manifestations of an extensive and active tuberculous infection without decided continued elevation of

* Read before the Denver and Arapahoe County Medical Society.

temperature are destined, under appropriate conditions of daily life and climate, to secure an ultimate and permanent arrest of the tuberculous process. Many others with defined physical evidences of both a lesser area of pulmonary involvement and a slighter degree of the activity of the tuberculous process but associated with frequent chilly sensations, decided elevation of temperature in the afternoon and night sweats, are foredoomed to grow progressively worse despite a perfected system of disciplinary control.

Having been compelled to witness the irresistible decline to a fatal issue of a large number of such cases, the resolution was made to begin the employment of the serum immediately upon my return to Denver, being convinced that while there was no definite assurance of success, at least there was nothing to lose and possibly something to gain from such a source.

After four months' experience with this agent, applied to the most desperate cases of consumption that can be imagined, I present a report in detail of results obtained, with the hope that perhaps therefrom something may be gleaned which, subject to further investigation and confirmation, may accrue to the material benefit of those afflicted with the dread ravages of the disease.

It should be noted that the serum was not employed in any case save as a last resort and only after other measures of regimen and climate had proven of no avail. In each instance the sputum was found to contain large numbers of streptococci before the serum was used. The sputum was deposited in a sterilized bottle early in the morning before food was taken and after the mouth and throat had been specially prepared.

That the serum has failed of actual results in a few of the cases here reported should be expected, as a matter of course. It justly may be construed a source of congratulation and surprise that it has not failed in all.

The report embodies a series of twenty-five cases of pulmonary tuberculosis selected from my private practice from the last of June to the last of October, 1902, and includes all the cases for whom the serum was used during this period.

The cases are reported in their chronological order, relative to the time of administration of the serum.

Case I.—Mrs. S., Murfreesboro, Tenn., twenty-four years old. Consulted me May 24, 1902, the day of arrival in Colorado. Family history good. Previous history good. First symptoms referable to present trouble developed in fall of 1901. Anemic onset, loss of flesh and strength with increasing pallor and dyspnea; frequent persistent cough. Weight, at best, 149 pounds, seven months ago. Present weight, less than 100 pounds. Had visited San Antonio, Tex., during the months of January and February with continued failure. Cough now excessive, especially at night. Expectoration for 24 hours, a large half cupful, purulent. Numerous bacilli. Great dyspnea on slight exertion. Chills daily for six or eight weeks. Night-sweats frequent. An afternoon temperature daily of from 101° F. to 102½° F. Pulse constantly over 120 in bed.

Examination of Chest.—Extensive tuberculous infection of left lung. Signs of consolidation with fine moist râles, after cough, to the fourth rib in front and in the back from the apex to the base. On the right side a slight general infiltration throughout with numerous fine clicks from the second interspace to the base in front, and from the middle of the interscapular space to the base in the back.

On account of the extensive pulmonary involvment, the great emaciation, the apparent sepsis which had been long continued, and a very nervous temperament, an absolutely unfavorable prognosis was rendered. It was apparent to the husband that the patient was too ill to undergo the exhaustion incident to a return home, and at his request suitable accommodations were secured, together with the services of a trained nurse, that her last days might be made as comfortable as possible.

On account of the desperate condition of the patient the serum was not used until June 26 and then with great reluctance. Despite the fact that for over a month she was kept constantly in bed in a large, well-ventilated, sunny room with four windows, easy of access to a porch, where she was frequently carried to recline upon a cot in the open air, and also despite the greatest possible degree of superalimentation, together with judicious cardiac stimulation, the patient had failed to respond in the slightest degree, save for a brief interval, to the influences of climatic change, mode of living or management. The temperature was constantly in the afternoon between 102°F. and 103°F., the pulse from 120 to 140, extremely weak, easily compressible and frequently almost impossible of detection.

The serum was used with great reluctance on June 26 and repeated the day following, and again two days later. Each injection was given in the evening. The afternoon following its first employment there was a very slight lowering of the temperature, but a change of one degree was not considered sufficiently distinctive to justify any conclusions as to the utility of the serum. A similar change was noted the day following the second injection. The temperature remained unchanged at the decline on the third day and the day after no further change being noted a final injection was administered. From this time until the present—April, 1903—there has been no hour of any day that the temperature has exceeded 99°F. For several days following the last injection, however, there was great prostration and approaching collapse to such an extent that the patient was expected to die hour by hour and was sustained only by heroic stimulation. The subsequent progress of the case has been one of uninterrupted and most remarkable improvement. With the persistence of a normal temperature at all hours of the day and the relief of the cardiac embarrassment and circulatory dis-

turbance, there resulted increase of appetite, improvement of digestion, gain in strength and weight, a diminution of cough with expectoration and opportunity for longer hours of sleep. The patient has remained under the same environment until the present time. The gain in weight to date is 43 pounds. The pulse is constantly in the neighborhood of 80 or under, sleep is unbroken, there has been no cough for nearly six months and no expectoration.

Physical examination discloses slight changes in pitch and quality of respiratory sounds on each side incident to the proliferation of fibrous tissue throughout the infected areas. From the left apex to the second rib occasional very fine semidry clicks are scarcely audible at end of inspiration following a cough. A few similar sounds, entirely devoid of bubbling character, are heard at very base of right lung in an exceedingly small area one-half the size of palm of hand.

Case II.—Mr. T., Appleton, Wis.; aged twenty-eight years. Consulted me May 10, 1902. Had been in Denver two days. Present trouble of one year's duration. Bronchitic onset. Had spent the last seven months in New Mexico and Northern Texas without improvement. Average weight 150, present weight 120. Cough frequent, severe; expectoration copious, bacilli numerous. Temperature averaging 102°F. each afternoon, pulse 108. No night-sweats; chills every afternoon.

Examination.—Extensive active tuberculous infection of each lung. Moist râles right apex to the base, large cavity below the clavicle. Left front, moist râles to the third space. Dulness and bronchial breathing both upper fronts. In the back moist râles with a considerable degree of consolidation apex to base on each side.

On account of a daily elevation of temperature and a very rapid pulse the patient was kept reclining on a cot on the porch, undressed, until June 27, when the serum was used for the first time. The temperature had averaged 103° F. every afternoon, pulse 130 to 140, and there had been frequent chills and copious sweats. The case was regarded as absolutely hopeless and the serum was used almost purely as an experiment.

The serum was used on three successive days and the patient was kept under observation for a week or ten days later. No effect was noted as far as reduction of temperature was concerned or other amelioration of the symptoms. Considerable prostration resulted, however, and the pulse immediately became somewhat weaker and the patient was subsequently advised to return home.

Case III.—Mr. B., Nashville, Tenn.; aged thirty-six years. Consulted me February 3, two days after arrival in Colorado. Present illness developed three months before. Acute onset, severe hemorrhage shortly after leaving his destination en route for Colorado. Several recurrences on the train and one the day following arrival. Night-sweats frequently, chills occasionally, fever daily, cough moderate, expectoration about four ounces in twenty-four hours.

Examination.—Consolidation with moist râles after cough, right apex to fifth rib and to lower third of interscapular space. Fine clicks after cough left supraclavicular fossa.

Patient was put to bed and absolute quiet enjoined until the hemorrhage had entirely ceased. This persisted, however, nearly 30 days, though not associated with very profound exhaustion. The temperature was constantly over 101°F. during this period. Subsequently there were no recurrences of hemorrhage and although quiet and an out-of-door existence was observed the patient grew gradually, though almost imperceptibly worse, temperature ranging from 101° F. to 103° F. each afternoon, associated with a very rapid pulse.

The serum was administered on June 27 and June 30 and was followed each time by an immediate, though temporary, drop in the temperature. This rose again on the third day following the second injection and necessitated the use of the serum for the third time on July 4. From July 4 until August 1 the temperature remained very nearly normal, although not associated with any visible improvement either in the physical signs or the general condition. It was used again on August 1, but although the temperature was kept at nearly normal for some time the patient made no apparent improvement and was finally sent home as a hopeless case.

Case IV.—Mr. H., Nashville, Tenn.; aged thirty-three years. Consulted me June 16, the day of arrival in Colorado. Sickness of four years duration. Frequent hemorrhages, very frequent and distressing cough; expectoration nearly ten ounces in twenty-four hours. Loss of 30 pounds in weight, temperature 103°F. and pulse 120 every afternoon.

Examination.—Extensive tuberculous infection of the right lung with large cavity in upper portion and moist râles nearly to base. Large cavity in left back. Consolidation of left upper front with small cavity below the clavicle.

The serum was used June 27 and the temperature dropped from one to two degrees, which reduction of temperature was maintained for over a week. On account of the extensive infection and poor financial condition the patient was advised to return home without further employment of the serum.

Case V.—Mr. B., Natick, Mass. Consulted me December 20, 1901, two days after arrival in Colorado. In hospital three weeks for typhoid fever one year before. Present illness developed Oct., 1901. Operations for rectal abscess September, October and November, 1901. Average weight 198, on arrival 177. Temperature every afternoon 100°F. to 100½°F.

Examination.—Signs of slight consolidation right apex with fine clicks after cough to second space and to a point just below the spine of the scapular. In the lower right back slight dulness and increased intensity of voice sounds without moisture.

The patient, owing to a readily assignable cause,

experienced a series of frightful hemorrhages beginning February 19, 1902, which involved a four weeks' sickness and nearly cost him his life. He subsequently rallied but continued to exhibit a daily temperature of 101°F. or thereabouts each afternoon. In the late spring and early summer gradual loss of flesh and strength took place with an increase in the activity and area of the tuberculous process. The serum was administered June 27 and was followed by a drop in the temperature which persisted for nearly two weeks. At the end of this time the temperature arose again and on account of his general prostration the patient was advised to return home.

Case VI.—Mrs. H., Jacksonville, Fla.; aged twenty-nine years. Consulted me June 18, one day after arrival in Colorado. Mother died of tuberculosis. Present trouble had been of 18 months' duration. Acute onset following pleurisy. Average weight 127 pounds. Present weight 95 pounds. Cough excessive. Expectoration, 24 hours, large cupful, purulent. Bacilli numerous. Night sweats every night, chills daily. Temperature every afternoon for many weeks over 102 degrees. Marked dyspnea on slightest exertion. Appetite very poor. Bowels very loose, five or six free movements a day, without blood, shreds or mucus. Pulse 120 at rest in the afternoon.

Examination.—Extensive active tuberculous infection of the left lung with moist râles throughout, and open pneumothorax at base. On the right side slight consolidation with fine, moist râles from the apex to the third rib and to the middle of the interscapular space.

The patient was placed in bed in a large airy, sunny room, opening on to a private balcony, and remained absolutely quiet for two months before improvement took place. The serum was given on June 29 without any appreciable result being noted. This was not repeated on account of the objections of the patient. The temperature remained during the first month between 102°F. and 103°F. each afternoon and then gradually receded, and has not been above 99 since the latter part of August. There has been a marked gain in the general condition, weight being increased 36 pounds, cough very much diminished, expectoration about two tablespoonfuls in 24 hours. Appetite excellent, pulse 80 to 90 all hours of the day, no night sweats or chills during the past six months. The examination of the chest at the present time shows very fine clicks left lung apex to base with an open pneumothorax without liquid. Entire absence of signs in the right lung.

Case VII.—Mr. F., New York City, twenty years old. Consulted me January 6, two days after arrival in Colorado. Family history, four near relatives died of consumption. Present trouble of four months duration. Acute onset following severe cold. Occasional chills and night sweats from the first, becoming much more frequent of late. Weight, four months ago, 150 pounds; now 129 pounds. Cough moderate, expectoration 24 hours two ounces. Appetite very poor, dyspnea on exertion. Temperature 102° F. each afternoon. Pulse 120 to 130.

Examination.—Signs of consolidation well marked with moist râles left lung apex to base.

In spite of perfect quiet and a constant out-of-door existence with the maximum amount of food, the patient progressively went from bad to worse, the temperature, chills and sweats becoming more frequent, with increasing loss of weight and strength, more severe cough and greater expectoration, and the tuberculous infection gradually becoming more active and extensive.

The serum was given on July 4, all hope having been despaired of and its use being determined upon simply as a last resort before advising a return home. It was followed by a drop in temperature within twelve hours. This remained at nearly normal for over a week with entire absence of chills and sweats and increase of strength and appetite. During the three weeks following the temperature arose but slightly, although occasionally elevated to 100½°F., but never going within one or two degrees of its former limit. During this time a gain of eight pounds was made in weight, together with a material improvement in the general condition. On August 1, the temperature having shown a tendency to rise, a second injection was administered which was attended with the same results as before. From this time until October 1 the patient experienced scarcely any elevation of temperature and suffered no return of the chills or night sweats, but was unable to make any further gain in weight. The pulse continued rapid, cough and expectoration profuse, no signs of lessening of the activity of the tuberculous process and the patient was advised to return home.

Case VIII.—Mr. L., Spencer, Ind.; aged forty-six years. Been in Colorado three years. Consulted me July 7. Present trouble began 3½ years ago, following pleurisy. Spent nearly a year in Asheville before coming to Colorado. Was summoned to see the patient on account of very severe hemorrhage. The condition of the patient did not justify any physical examination for two weeks, when an extensive active tuberculous infection was recognized in each lung. Marked consolidation with moist râles after cough from the right apex to the base front and back, left to the third rib.

The hemorrhages were checked after a few days, but a high fever ensued together with rapid respirations and very feeble and extremely rapid pulse. Without attempting to make complete physical examination at this time a provisional diagnosis was made of septic pneumonia. The respirations were nearly 50, pulse 130 to 140 and the temperature 103°F. to 104°F.

The serum was administered on the morning of July 13, at the very height of the unfavorable symptoms. The temperature dropped to 100°F. that evening, and to normal during the night, and has never since gone over 98⅗° F. The patient has made a progressive and uninterrupted improvement with marked amelioration of all the

symptoms including very great gain in weight. At the present time there is absence of cough and expectoration, and very marked diminution of the activity of the tuberculous process as shown by the physical signs.

Case IX.—Mr. O., aged twenty years. Consulted me July 24, three weeks after arrival in Colorado. Present trouble of seven months duration. Hemorrhagic onset. Several recurrences. Average previous weight 150 pounds, present weight 128½ pounds. Cough very considerable, expectoration, 24 hours, two ounces. Appetite poor, bowels very loose, dyspnea on very slight exertion, occasional night sweats and chills, fever every afternoon from 102° F. to 103° F. Pulse 108 to 120.

Examination.—Signs of consolidation with numerous medium-sized moist râles, right apex to base in front and back. Patient was kept under observation for five days in bed without any diminution of temperature or pulse being noticed.

The serum was administered on the evening of July 29. There followed no elevation of temperature above 99° F., no chills or night sweats until August 8. During this time he gained appreciably in strength, appetite improved, cough and expectoration diminished. On August 8, the temperature having risen during the day to over 100° F., the serum was administered again. Following this there was no further elevation of the temperature for several weeks. One month later, viz., September 1, he had gained nine pounds, was eating well, coughing but little and expectorating considerably less than on arrival. The temperature had been but slightly elevated at any time. On September 16, the temperature having been over 101° F. for a few days previous, the serum was administered again and was followed by a drop of one degree in the temperature. A few days later he left for Arizona to spend the winter. Physical examination made before departure showed much less moisture in the chest, although the limits of the affected area were not diminished.

Case X.—Mr. M., Chicago, Ill.; twenty-four years old. Consulted me July 18, one week after arrival in Colorado. Family history and previous history good. Present trouble of six months' duration, preceded by an attack of so-called typhoid fever from which he never fully recovered. Expectoration very slight less than one-half ounce in 24 hours. Cough also slight; no chills, no night sweats, marked dyspnea on exertion, appetite very poor, temperature over 101° F. each afternoon, pulse 120 at rest.

Examination.—Signs, consolidation each apex with fine clicks after cough on the right side from the apex to the fourth rib. On the left side from the apex to the very base. In the back fine clicks at the very apex on the left and on the right side from the apex to the lower third of the interscapular space.

After ten days' observation of the patient in bed the temperature was found to be over 102°F. each afternoon and frequently higher. There was a perceptible loss in general condition. The serum was administered July 30 and repeated August 1 with no result. A few days after inequality of the pupils was observed, followed by other unmistakable evidences of tuberculous meningitis from which the patient died after the lapse of five or six days.

Case XI.—Miss S., Lafayette, Ind.; aged twenty-five years. Consulted me December 23, 1901, four days after arrival in Colorado. Illness at that time of six months' duration. Of anemic onset. Marked emaciation, chills and fever daily. Cough and expectoration moderate. Absence of menstruation for six months. Marked dyspnea on exertion. Pulse 132 at 11 A.M. sitting. Temperature 101°F.

Examination.—Extensive active tuberculous infection of each upper lung. Signs of marked consolidation and moist râles nearly to fourth rib each side.

Under a more or less perfected system of management the patient made marked improvement in all respects. May, 1902, there was entire absence of moisture in both lungs save for a few fine clicks below the clavicle on the left side. General condition much better.

The patient continued to improve until a sudden hemorrhage in the middle of the summer left her with greatly impaired vitality and a daily temperature of 102° F. to 103° F. The serum was used August 6 and repeated in two days, since which time there has been no elevation of temperature. There has ensued a marked improvement in the general condition as evidenced by very slight cough and expectoration and gain of fifteen pounds in weight. Examination now shows no moisture in either lung.

Case XII.—Mr. W., Dayton, O.; aged twenty-five years. Consulted me June 26, day after arrival in Colorado. Present trouble of six months' duration. Bronchitic onset, several severe hemorrhages. Pulse at 11 A.M. 118; temperature 101° F. Dyspnea on exertion. Loss of 27 pounds in weight.

Examination.—Signs of consolidation with numerous moist râles over entire left chest apex to base front and back.

The patient was kept in a state of perfect quiet and rest out of doors, sleeping in a tent in the country and taking the maximum amount of food. At the end of six weeks he exhibited a gain of five pounds in weight without the slightest improvement in the physical signs, or in the cough or expectoration, or in the temperature record. As a matter of fact, the process meanwhile was found to have involved the other lung. The temperature being over 101° F. each afternoon. The serum was administered on August 6 and repeated the next day. The temperature subsided to normal immediately and remained so for several weeks, but was attended subsequently with material improvement in the general condition. A very copious hemorrhage which took

place in September was not associated, nor followed by any rise of temperature. The patient remained remarkably well until the early part of October, when the fever rose suddenly, following a chill, and remained elevated over 102° F. for five days. The serum was administered on the evening of the fifth day, the temperature then being 104° F. The next day the temperature did not go above normal nor has it done so since, and he has gained since the time that it was administered nearly five pounds. His cough and expectoration are much diminished. No signs of disease are recognized in the right lung.

Case XIII.—Mrs. T., aged twenty years. Consulted me June 25, two weeks after arrival in Colorado from California, furnishing the history of having suffered from several severe attacks of pneumonia. Had been coughing for two weeks from a severe cold contracted on the train; temperature elevated less than one degree in the afternoon, cough severe and frequent, slight pain in the left side.

Examination disclosed the presence of numerous loud moist râles in the left side and back from the middle third of the interscapular space to the base. Throughout this region there was a slight change in the pitch and quality of the respiratory sounds with prolongation of expiration indicating slight consolidation.

The patient had lost 25 pounds in weight during the past six months, was anemic and complained of feeling tired constantly. The examination of the sputum failed to show the presence of any tubercle bacilli. Under appropriate supporting treatment and proper medication the patient failed to exhibit the slightest improvement whatever. On the evening of July 6 during my absence from town, a sharp rigor was experienced, followed by an immediate rise of temperature and severe pain in the left lung, especially on inspiration. A physician being summoned pronounced it a case of pneumonia and administered veratrum viride. Upon my return early the morning of August 7, I found well-defined consolidation of the lower lobe of the left lung with innumerable fine clicks at the end of inspiration. Temperature 102° F., pulse 120, bounding. The serum was administered and the veratrum viride discontinued. The bowels were freely moved, salicylates given for one day and from the morning of August 8 there never has been any elevation of temperature whatever. The cough almost immediately became looser though without much expectoration. Within 48 hours the consolidation was less marked and moist râles less numerous. The patient was kept in bed for two weeks, at the end of which time the moisture had entirely disappeared from the chest, together with all evidences of consolidation. The patient has since led an out of door life and gained 30 pounds without any return of cough or recognition of physical signs.

Case XIV.—Mr. H., Boston, Mass.; aged forty-one years. Consulted me June 16, one day after arrival in Colorado. Typhoid six years ago, with relapse three months later. Has never been well since. Temperament excessively nervous, and on account of this, with loss of weight, without pulmonary infection being recognized, was sent to the Adirondacks in 1895 and various other health resorts. Pulmonary tuberculosis was recognized the summer of 1901. Cough severe, loss of weight marked, had night-sweats for six or eight months, weight 133 as compared with previous weight a few years ago of 170. Cough very excessive, disturbing sleep greatly. Expectoration 24 hours four ounces, raised with difficulty. Cough paroxysmal. Appetite very poor, digestion bad. Marked dyspnea on slight exertion. Fever every afternoon. Pulse from 110 to 120, temperature from 100½° F. to 102° F.

Examination.—Extensive involvement of the left lung. Signs of consolidation with fine moist râles apex to base front and back. On the right side less consolidation with fine clicks after cough apex to the third rib.

Urine contained a large amount of sugar. Specific gravity 1.040. Quantity in 24 hours averaging between four and five quarts.

The services of a trained nurse were at once secured and the patient sent into the country, where he lived an out of door existence for several weeks, receiving rigid attention as to the regulation of diet. A moderate improvement was noted in the urine, together with slight gain in weight and increase of strength, the temperature, however, remaining in the neighborhood of 100° F. to 101° F. each afternoon, although sometimes higher. In the latter part of July and early in August the cough became much more severe, occurring in very frequent and distinct paroxysms, expectoration copious, temperature more elevated together with the pulse, and the nervous condition increasing in spite of the absolute quiet and rest enjoined and of the opium treatment which had long been instituted for the diabetes.

The serum was administered August 8 and was followed within 24 hours by a drop in temperature to normal. The temperature has not since risen and the cough has become immeasurably improved. The physical signs show a material lessening of the activity of the tubercular process. There is no longer physical evidence of disease in the right lung and there is materially less moisture in the left, the râles being recognized only from the third rib to the base on the left side.

Case XV.—Miss D., Uniontown, Pa.; aged thirty-two years. Consulted me July 30, two weeks after arrival in Colorado. Present trouble of five months' duration, following pneumonia. Much emaciation. Expectoration 24 hours two drams. Cough paroxysmal. Dyspnea on slight exertion. Temperature averaging 102° F. in the afternoon.

Examination.—Extensive involvement left chest with fine moist râles apex to base front and back. Signs of consolidation throughout. On the right side slight consolidation with moist râles

apex to second rib and to lower angle of the scapular in the back.

The patient was kept at rest in bed with open doors and windows until August 8 without there being recognized any appreciable drop in temperature, at which time the serum was given and was followed by a considerable remission of temperature lasting for several weeks and associated with a gain in general condition. Subsequently the patient became exceedingly despondent on account of financial and domestic disturbances and was finally advised to return home.

Case XVI.—Miss C., Albany, N. Y.; aged twenty-four years. Consulted me Nov. 6, 1901, ten months after arrival in Colorado. Present trouble then of two years' duration. Had failed progressively from the beginning. Temperature usually two or three degrees above normal in the afternoon.

Examination.—Extensive tuberculous infection of each lung. Consolidation with moist râles left apex to base, right from apex to third rib.

Under a strict system of discipline and supervision a gradual improvement took place until June, 1902. A gain of 14 pounds being registered together with a lessening of the activity of the tubercular process as shown by a diminution of the moisture. In June, 1902, a severe cold was taken during menstruation, resulting in pelvic peritonitis and abscess, a large mass forming in the right lower abdomen. The patient being in the mountains at the time, was removed to Denver and admitted to St. Luke's Hospital and laparotomy performed, and a large amount of fetid pus evacuated, provision being made subsequently for vaginal drainage. The patient rallied slowly from the shock of the operation and for a few weeks following maintained a constant temperature of from 102° F. to 104° F. The serum was used twice without effect and the patient died about four weeks following the operation.

Case XVII.—Mr. R., Cleveland, O.; aged thirty-one years. Consulted me August 30, one week after arrival in Colorado. Present illness of seven months' duration. Acute onset supposed to follow typhoid. Frequent night-sweats, cough very severe, disturbing sleep, marked dyspnea on exertion, temperature from 103° F. to 104½° F. every afternoon; pulse 120 to 140; emaciation great.

Examination.—Signs of consolidation each apex with moist râles apex to base on the right side. Moderate cavity below the right clavicle. Moist râles from the apex to the lower angle of the scapular behind. Left side fine clicks after cough, apex to base and in the middle of the interscapular space.

Suitable accommodations were obtained for the patient and the services of a trained nurse secured. The temperature showed no tendency to drop for a period of two weeks and on September 16 the serum was given. Since this time the temperature has maintained an average daily of two degrees lower than for the time previous to the administration of the serum, and the pulse has maintained an average of 100. There being no change for the better in the general condition and a tuberculous laryngitis becoming more extensive with beginning ulceration of the free border of the epiglottis interfering with the deglutition, the patient was advised to return home.

Case XVIII.—Miss K., Joliet, Ill.; aged twenty-one years. Consulted me August 20, one year after arrival in Colorado. Present trouble has been of two years' duration, following an acute pleurisy. Average previous weight, 135 pounds, on arrival one year before 110. Weight, at the time of the examination, 114½ pounds. Chills daily for many weeks; temperature every afternoon for six or eight weeks 102° F. to 103° F. in the afternoon. Cough considerable, expectoration 24 hours one-quarter cupful. Dyspnea on slight exertion.

Examination.—Consolidation with fine moist râles right apex to second space, back to spine of the scapular. Left more extensive consolidation with moderate sized moist râles to the base front and back. Small cavity in the upper right back.

The patient was placed in the best possible surroundings in bed in a large, airy room, opening onto a porch and attended by a skilled nurse. During a period of three weeks a high degree of superalimentation was afforded with absolute rest at all hours of the day either in bed or on the porch. No material improvement was noted in any respect. One week later, the patient being palpably weaker, the temperature higher with an increase of cough and with daily chills it was decided to administer the serum. This was given September 17. At this time in view of the physical condition, nervous temperament, the progressive loss of weight and the length of residence in Colorado under the most favorable conditions, the case had been given up as absolutely hopeless. A few days after the serum was given the temperature became materially lower and the patient began to gain in general condition. She remained in Colorado for several weeks constantly, showing marked improvement. It then became necessary, in view of family considerations, to permit her to return to Illinois. Her weight was then 120, temperature normal, cough and expectoration diminished. She returned to Colorado in November weighing 125 pounds, an increase of 10½ pounds, and has since gained twenty pounds more. She has had a normal temperature during her absence and since her return, with greatly diminished cough and expectoration.

The examination of the chest at this time shows much less moisture in the chest and very apparent evidences of a degree of arrest being secured in the tuberculous process.

Case XIX.—Miss M., Albany, N. Y.; aged twenty-nine years. Consulted me April 26, five weeks after arrival in Colorado. Present trouble of five years' duration. Began with cough and pleurisy. Loss of weight on arrival ten pounds from the average. Appetite and digestion fair, no fever, pulse 108 in forenoon, sitting.

Examination.—Extensive infection of each lung. Signs of consolidation with fine clicks after cough left apex to fifth rib, and to the lower third of the interscapular space. Right no evidence of consolidation, but fine clicks to the third space and to the spine of the scapular.

The patient exhibited a satisfactory gain in all respects until September 30, when a sudden and severe hemorrhage took place. On the second day following the hemorrhage the temperature rose to 103⅗° F. together with a pulse of 124 and respiration of 30. The serum was administered at this time and repeated on the morning of October 3, and again on the evening of the same day; the temperature in the meantime showing a progressive tendency to decline. The temperature was normal through October 4 and 5, until the latter part of October 5, when it rose steadily to 103° F., attended with great prostration and extremely rapid and feeble pulse. Death occurred the night of October 5.

Case XX.—Mrs. S., aged forty-three years. In Colorado 12 years. Consulted me August 2, 1902. Present trouble began 18 years ago. Anemic onset. Case of distinctly fibroid type of tuberculosis. Chills and hemorrhages occasionally; fever every afternoon from .101° F. to 103° F., cough very severe, expectoration, eight ounces in 24 hours.

Examination.—Signs of marked consolidation, each lung with coarse moist râles right apex to base, left apex to fourth rib. Large cavity below the left clavicle.

After forced feeding, absolute rest in bed and with the constant attention of a nurse, the patient manifested a temporary amelioration of the symptoms and gain in weight. This was continued without any material interruption until the latter part of September, when a chill occurred with a sharp rise of temperature, an increase of cough, pain in chest and exacerbation of all the symptoms. This continued for four or five days and was accompanied with great prostration.

The serum was used on October 3. An immediate drop of temperature took place, which decline was maintained until the evening of October 9, when, with a returning elevation, the serum was again used, to be followed in turn by another remission. The temperature rose again on the evening of October 11 and the serum was once more given. The temperature continued at about normal for over a week, the patient remaining, however, very much prostrated and evincing symptoms of approaching dissolution. The patient died October 23.

Case XXI.—Miss B., Newburg, N. Y.; aged twenty-six years. Consulted me September 10, three months after arrival in Colorado. Had lost three members of immediate family with consumption. Present trouble of two years' duration, several hemorrhages. Average weight 117 pounds, on arrival 85 pounds. Had previously failed to secure improvement from one year's residence in the Adirondacks and six months' stay at the Loomis Sanitarium and a two months' residence at Tucson. Had remained three months at Colorado Springs without improvement. Cough very excessive; expectoration, four ounces in twenty-four hours. High fever every afternoon; marked dyspnea on slight exertion.

Examination.—Extensive active tuberculous infection of each lung. Signs of consolidation right apex with fine moist râles to the base. On the left side large coarse moist râles to the base front and back.

The patient in spite of ideal accommodations, careful attention to mode of life and the services of a skilled nurse, having shown no improvement the serum was given on October 5 and attended by no good results. The pulse on the contrary, became perceptibly weaker and more rapid for four or five days following to such an extent that death was feared. Upon her rallying sufficiently to undertake the journey she was immediately sent home.

Case XXII.—Mr. T., age 22 years. Peterboro, Ont., Canada. Consulted me September 29, ten days after arrival in Colorado. Present trouble began three months earlier with bronchitic origin, loss of flesh and strength. Slight hemorrhage in August, with several recurrences. Average weight 182 pounds, on arrival 155 pounds. Night-sweats frequent, cough considerable, disturbing sleep. Expectoration 24 hours one-half cupful. Dyspnea upon exertion; temperature 104° F. at 5 P.M.; pulse 144, sitting.

Examination.—Signs of consolidation with fine moist râles after cough right apex to base front and back. Left to second rib and to spine of scapular.

The patient was provided with a tent and afforded the attention of a nurse for a period of two weeks until October 8, during which time he lost four pounds, without there being any apparent improvement in general condition or physical signs.

On October 8 the serum was administered and repeated every second day for four days, following which the temperature subsided to normal and has remained very nearly that ever since. In the ensuing three weeks he gained eight pounds in weight, which gain has since been maintained. He has very much less cough and expectoration, an excellent appetite and is increasing in strength. The examination of the chest discloses only an occasional very fine click after cough above the clavicle on the left side, and the moisture considerably less free on the right side.

Case XXIII.—Mrs. J., age thirty years. Chicago, Ill. Consulted me October 17, the morning of arrival in Colorado. Present trouble of one year's duration. Bronchitic onset, progressive loss of flesh and strength, with increase of cough and expectoration. Weight, on arrival, 100 pounds, as compared with an average weight of 125 pounds. Night-sweats daily; hemorrhage two days before arrival; having been placed upon the cars a few hours after the hemorrhage took place. Temperature at 11 A.M., 104° F.; pulse 132. Had not menstruated for three months.

Examination.—Extensive tuberculous infection of the left lung, consolidation at apex with fine clicks to the base front and back, considerable cavity formation in upper front. Right less consolidation with fine clicks to the fourth rib and middle of the scapular.

The serum was administered that night and again the day following. The temperature subsided immediately after the second dose. Several days after the patient became very ill. There was an extremely rapid pulse attended with a severe urticaria and pains in nearly all the joints. This lasted several days, since which time the temperature has remained almost normal until the present time. She has gained four pounds in weight, is coughing and expectorating very much less and has an enormous appetite.

Case XXIV.—Mr. S., age thirty-three years, Birmingham, Ala. Consulted me September 2, one week after arrival in Colorado. Present trouble of two years' duration. Began with hemorrhage, frequent, almost daily, chills for past year, with night sweats. Average weight, 181 pounds; on arrival, 120 pounds. Cough moderate, disturbing sleep, expectoration 24 hours, about four ounces, appetite and digestion poor. Temperature from 102° F. to 103° F. every afternoon; pulse 124 to 130.

Examination.—Signs of consolidation each apex with fine moist râles right apex to base front and back, left fine clicks to the base in front, no moisture in back.

The patient was provided with a tent in a suitable location and received the attention of a nurse. He was kept in bed whenever the temperature was above normal, but was allowed to remain on the porch in a steamer chair during the forenoon. From September 2 to October 18 there was at no time the suggestion of an improvement as far as the temperature and pulse were concerned, and the serum was therefore administered on October 18 and repeated October 20. From that time until the present, there has been no elevation of the temperature over 99° F. at any hour of the day. He has made a marked improvement in strength and weight, the total gain since arrival being 14 pounds. There is a perceptible gain in the physical condition. Less moisture in the right lung and almost none in the left.

Case XXV.—Miss B., age eighteen years. Indianapolis, Ind. Consulted me September 30, 1901, one week after arrival in Colorado. One sister and father died of tuberculosis. Present trouble of eight months' duration, bronchitic origin. Weight, at best, 126 pounds in winter of 1900; on arrival, 124 pounds. Cough moderate; expectoration, one ounce in 24 hours; pulse, 120 in the afternoon sitting, temperature 101° F.

Examination.—Slight consolidation and fine moist râles after cough left apex to third rib.

Under an appropriate system of daily life the patient exhibited a pronounced gain in all respects. Physical evidence of the infection disappearing entirely and a gain of 25 pounds being noted in the winter and spring of 1901 and 1902. A severe attack of the grip occurred late in the spring of the past year, confining the patient to bed for a number of weeks, and was followed by an increase of cough, which persisted, together with marked loss of weight and strength. The weight was reduced to 122 pounds, less than on arrival. A temperature was maintained constantly above normal and expectoration became profuse. A residence in the mountains of Colorado during the summer and the constant employment of a systematic regime sufficed to produce a partial arrest of the activity of the tuberculous process. The cough and expectoration improved; the weight increased to 132 pounds and the temperature was restored to normal at all hours of the day. The improvement continued until October 20, when a rigor occurred, followed by a sharp rise of temperature, pain in the left chest and back, together with a readily recognized extension of the tuberculous process into the axilla of the affected side. The serum was administered on October 21, since which time the temperature has remained very close to normal.

Examination, made recently, shows no evidence of moisture within the chest. Moderate consolidation left front, but no adventitious sounds recognized.

A thoughtful review of these reports suggests the following two conclusions with reference to this series of cases: (1) The serum in every instance, save one, was used in apparently hopeless cases of pulmonary tuberculosis, or at best, in those presenting most unfavorable prognostic indications; (2) that such important factors as a favorable climate and a due supervisory control, without serum, were insufficient in these cases to secure arrest, but with the addition of the serum, as an adjuvant, did effect varying degrees of improvement.

A brief résumé of results indicates that out of a total of 25 cases, Case I presents such remarkable improvement as to insure practically a complete and permanent recovery. Case XIII secured speedy termination of a streptococcic pneumonia, and Case VIII recovered promptly from a severe septic pneumonia following hemorrhage in consumption, and now bids fair to secure an arrest of the original infection.

Three cases may be put in Class A, as representing the best possible results.

Class B includes four cases: XI, XII, XXI, and XXIV, showing very marked improvement directly attributable to the serum and of sufficient extent to turn the prognostic balance in favor of ultimate arrest.

Class C is composed of five cases: IX, XIV, XVIII, XXII and XXIII, all of whom exhibit definite improvement, although the final prognosis is as yet uncertain.

Class D comprises eight cases: III, IV, V, VII, XV, XVII, XX and XXI, all showing a degree of improvement, but not such as to materially modify a previous unfavorable prognosis.

Class E comprises three cases: VI and XIX, in which the effect of the serum, if any, remains in doubt.

Class F comprises three cases: II, X and XVI, in which no actual result was exhibited, the serum being, in the light of subsequent developments, inapplicable to at least two of these.

It is well to add that in a large number of cases a urticaria developed in from three to ten days following the injection. In several cases severe pains in the joints with stiffness were experienced.

Without commenting further upon these results, it is perhaps sufficient to state that if the fact has been established that the serum, even in a single case from the entire list, has been instrumental in conjunction with appropriate measures of management in restoring the patient to health, its utility and beneficence are amply demonstrated, and a justification offered for this report.

THE ORIGIN OF THE EOSINOPHILES AND THEIR DIAGNOSTIC AND PROGNOSTIC IMPORTANCE.*

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AMONG the factors which are tending to make medicine an exact science and to redeem it from the empiricism which has been its chief characteristic up to a comparatively recent time, nothing has played such an important part as the growth of the laboratory method of study and the application of the findings obtained therein to the intricate problems associated with the pathology and etiology of disease, the method of arriving at a correct diagnosis and prognosis and the proper treatment to be employed. Within recent years the clinical laboratory has come rapidly to the fore, and among the results obtained therein we feel that none have been fraught with more importance than those derived from the study of the blood in health and disease.

As is well known, the blood has several constituents, red-blood cells, white-blood cells or leucocytes, blood plates, blood dust, as well as the plasma or fluid portion, but in this communication we shall only discuss the second of these constituents—the leucocytes, and especially that variety of leucocytes which, from the reaction of its granules is known as the eosinophile or acidophile leucocyte, taking up its mode of origin and the significance of an increase or decrease of these cells, and carefully considering the value of these cells in diagnosis and prognosis.

That the eosinophile is an important cell in the animal economy seems highly probable from the fact that it has been found in the blood of practically all mammals, as shown by the careful studies of Schwartze, Metschnikoff, Sherrington and others, and this wide distribution, associated with the striking biochemical character of the cell, have made it a favorite object of study among hematologists. Of course, besides the general eosinophilia, that is, where there is an eosinophilic increase in the blood, there is a local eosinophilia, which is extremely interesting and the study of which will undoubtedly prove of great value in determining the mode of origin of these cells. Among the places where eosinophiles are to be found in greater or less amount may be mentioned the intestinal mucosa, especially when irritated by certain intestinal parasites and chemical irritants the skin, especially in certain cutaneous diseases, various tumors, especially those of a malignant nature, various exudates and excretions, especially those due to the gonococcus, nasal polyps, the secretion in bronchial asthma and the bone-marrow, which last habitat is of special interest in connection with the enormous eosinophilic increase met with in splenomyelogenous leucemia, and with the question of the seat and mode of origin of the eosinophiles.

In this paper we will discuss in order the proportion of the eosinophiles normally met with, the theories held regarding the origin of these cells and their function, and then discuss at some length the diseases in which an increase of these cells is met with, the significance of such an increase, and whether it is of service in diagnosis or prognosis.

As to the proportion of the eosinophiles normally met with, various observers have given slightly different figures, thus, Ehrlich gives 2 to 4 per cent., Hayem 7 per cent., Gabritschewsky 1 to 3 per cent., Müller and Rieder 1 to 4 per cent., Canon 1 to 3 per cent., von Limbeck 2 to 8 per cent., Uskov 6 per cent., Zappert .67 to 11 per cent. and Weichselbaum 5 per cent. From our own studies of 100 or more normal adults we have concluded that the average number of leucocytes per c.mm. is 6,500, of which 74 per cent. should be polymorphonuclear neutrophiles, 18 to 20 per cent. small and .5 to 7 per cent. large mononuclears and transitionals, and 1 to 2 per cent. eosinophiles. Zappert regards 50 to 100 eosinophiles per c.mm. as low normal, 100 to 200 as intermediate, 200 to 300 as high normal, and over 300 as pathological. According to the work of a number of investigators the percentage of the eosinophiles is independent of the age of the individual and also independent of the digestion.

The question of the seat and mode of origin of the eosinophiles is obviously of great importance in determining the significance of their increase or decrease, and yet it is a question which is far from being solved at the present time. Thus, Ehrlich believes that these cells are derived from preexisting eosinophiles often of the mononuclear variety in the bone-marrow. Uskov, Gulland and Pfeiffer, on the other hand, believe in the non-specificity of the cell granules, that is, that all are derived from a common form, the cell appearing in each case depending on the locality and condition. Müller and Rieder think that they are derived from the polymorphonuclear eosinophiles in the circulating blood, while various theories are held regarding a local origin of these cells, among which may be mentioned Kanthack and Hardy's theory that they are derived from fixed connective tissue cells in the intestines and serous cavities, Howard's belief in their origin from plasma cells, various views regarding

*Read at the Annual Meeting of the New York State Medical Society, at Albany.

their origin from the eosinophiles normally met with in the tissues, Kischensky's view that in bronchial asthma they are formed from the neutrophiles in the mucosa, and the theory advanced by us six years ago that in trichinosis the eosinophilic increase may possibly be due to a conversion of the neutrophiles into the eosinophiles in those portions of the muscle into which the trichinæ have wandered and set up their pathological changes.

We cannot help feeling that while Ehrlich's theory—an origin from preexisting eosinophile bone-marrow cells—probably best explains the increase of these cells in most cases, a local origin of these cells from neutrophiles is probable in certain cases, notably bronchial asthma and trichinosis.

As to the exact nature of the eosinophile granules many widely divergent views have been held, some founded entirely upon staining reactions, others built on a more physical basis; all more or less hypothetical, some very far-fetched and bizarre. Up to the time of the introduction of the Ehrlich stain, these coarse, highly refractive granules were regarded as fat droplets from their original discovery in 1846 by Wharton Jones. The work of Ehrlich demonstrated that these granules are not fat, but are bodies possessing a marked affinity for the acid coloring matters, and by him and his school they are regarded as a sort of nutritive reserve, built up by the cell for its own use or for excretion, and thus, according to Schwarze, somewhat resembling the aleuron granules or crystalloids of plants. Zappert and Przewoski insist that these granules are of the nature of proteid, and Pouchet and Bannwarth have regarded them as related to or identical with hemoglobin. Sherrington, on the other hand, regards them as a form of nucleo-albumin, while Kanthack and Hardy believe them to be secretory products containing a zymogen, giving rise to alexines or other substances of great activity in phagocytosis and in conditions of inflammation and intoxication, and Noesske, from a study of the eosinophile cells in their relation to the infectious surgical diseases and tumors, concludes that the eosinophiles play the rôle of protectors against the invasion of bacteria. In all the above views the granules are regarded as paraplastic in nature, but Gulland holds that they are plasmatic, in other words, that they represent an altered condition of the microsomes, and are connected by a mitoma.

Now let us discuss as briefly as possible the various diseases in which eosinophilia is found and consider the value of this increase in diagnosis and prognosis.

In leucemia the enormous increase of these cells in the splenomyelogenous form helps to differentiate it from the lymphatic leucemia in which the eosinophiles are practically absent, and the presence of the eosinophilic myelocytes is of importance in showing the part the bone-marrow plays in the origin of the eosinophiles.

In bronchial asthma the increase of the eosinophiles in the blood is quite marked, sometimes reaching more than 30 per cent., and this in association with the appearance of large numbers of the eosinophiles and Charcot-Leyden crystals in the sputum serves to differentiate this form of asthma from the cardiac or renal asthma.

In connection with the association which is frequently noted between the eosinophiles and the Charcot-Leyden crystals it seems worth while for us to call attention to the work which we have done regarding the origin of these crystals. From a large series of carefully performed experiments in which the eosinophiles were exposed to various influences we have been able to definitely show that the Charcot-Leyden crystals are not direct crystallization products of the eosinophiles, and in this conclusion Müller of Vienna coincides as a result of his experiments on pemphigus.

There are no series of diseases in which eosinophilia is more interesting or more important than those due to various intestinal parasites, especially the *Trichina spiralis* and the *Uncinaria*, or *Anchylostoma duodenale*. In 1897 we reported a case of trichinosis in which a careful study of the blood showed a marked eosinophilia associated with a high grade of leucocytosis and the result of the study of this case and of two cases studied by us the next year led us to the following conclusions: (1) There is a marked increase in the percentage of the eosinophiles in the blood in trichinosis associated with a considerable leucocytosis, and this increase may be used as a diagnostic sign in this disease. (2) This disease in its sporadic form is more common than has hitherto been supposed, so that a systematic blood examination should be undertaken in all cases with indefinite intestinal, muscular or febrile symptoms in the hope that in some, at least, of the hitherto undiagnosed cases, the diagnosis may be reached.

We reported an additional case in 1899, and of these four cases the last three were diagnosed entirely by blood examination, as two of them had been previously diagnosed as typhoid fever and one as estivo-autumnal malaria. In all four cases the diagnosis was substantiated by an excision of a small piece of muscle and the demonstration of living active trichinæ therein. In the first case the eosinophiles reached 68.2 per cent. and the leucocytes 35,700; in the second case 42.8 per cent. and 13,000; in the third case 49 per cent. and 17,000, and in the fourth case 48 per cent. and 18,100. From our careful study of the blood and muscle in these cases we hold that it is highly probable that in this condition, at least, the eosinophiles are derived from the neutrophiles, transition taking place in the affected portions of muscle. Our arguments are based on the reciprocal relationship existing between the neutrophiles and eosinophiles, the presence of forms which we regarded as transitional cells between neutrophiles and eosinophiles in the affected muscle, and the fact that there was a larger proportion of the eosinophiles in the veins than in the arteries of

the tissues adjacent to the affected portion of muscle.

That our conclusions regarding the diagnostic value of eosinophilia in trichinosis have been justified has been, we feel, definitely proven by the increasing number of cases of trichinosis diagnosed by the blood findings, for in practically no other condition is such a high percentage of the eosinophiles associated with such a marked increase of leucocytes met with. Atkinson, Blumer and Newman, Stump, Kerr, Gordinier, Cabot and others have reported in all between 20 and 30 cases of this disease so diagnosed, and this corroborative evidence seems to show that the blood picture may be regarded as a definite diagnostic sign in this disease.

In anchylostomiasis or uncinariasis we have again a high grade of eosinophilia but almost always associated with little or no leucocytosis and always associated with a progressive anemia, often reaching a very high grade and presenting many of the clinical signs of pernicious anemia. Zappert, Leichtenstern and others have reported marked eosinophilia in this condition. The fact that a number of cases of anchylostomiasis has already been introduced into this country from our insular possessions and the recent demonstration by Stiles (of the Bureau of Animal Industry) that the disease is met with to a considerable extent in Georgia and other of the Southeastern States should make us regularly examine the blood in all cases of progressive anemia, and if eosinophilia is also present the stools should be most carefully examined in the hope of finding there the ova or the embryos of the anchylostoma.

In the case of a number of other intestinal parasites, an eosinophilia has been occasionally met with, as in the case of the *Oxyuris, Ascaris, Tænia* and *Bothriocephalus,* and it has also been reported in the case of *Echinococcus* and *Bilharzia,* while recently Calvert has demonstrated a moderate leucocytosis with an increase of the eosinophiles, reaching 22 per cent. in one case, in filariasis. Gulland and Coles have met with this same condition and the former found that both the leucocytes and the proportion of eosinophiles increased during the night when the embryos appeared in the circulating blood.

Among the acute and chronic infectious diseases in which the eosinophiles may aid us in reaching the diagnosis or giving the prognosis may be mentioned scarlet fever, tuberculosis, typhoid fever, malaria, syphilis, gonorrhea, smallpox, and occasionally a few other of the infectious diseases.

In scarlet fever Kotschetkoff was the first to call attention to the fact that during the first and second weeks of the disease, in favorable cases, there was a distinct increase of the eosinophiles, sometimes reaching 15 per cent., while in the fatal cases this increase was not met with; these observations have been substantiated by Zappert, ourselves and others. In the three cases which we studied of this disease the eosinophiles varied between 6 and 12 per cent. during the second week. All of these cases terminated favorably.

In tuberculosis a number of observers, notably Teichmüller, have insisted that an increase of the eosinophiles in the blood and in the sputum is a favorable prognostic sign.

In typhoid fever all observers, notably Naegeli, describe an early disappearance of the eosinophiles, and the work of this observer seems to show that the early reappearance of these cells is a distinctly favorable prognostic sign, while in chronic malaria moderate eosinophilia is often met with, and may be a real help in diagnosing this condition.

In syphilis and in gonorrhea some observers have noted a slight eosinophilia, while in the urethral secretions in the latter disease large numbers of the eosinophiles are usually met with.

In smallpox Weil finds some eosinophilic myelocytes, while a slight eosinophilia has been described in leprosy, mumps, tonsillitis, and beriberi.

In a number of mental and nervous diseases a slight eosinophilia has been described by Zappert, Neusser, Capps and others. Recently from 12 observations on cases of chorea of varying degrees of severity, we have concluded that there is regularly a slight eosinophilia varying between 5 and 9 per cent. in this disease.

In diseases of the skin an eosinophilia both local and general has often been described. Thus, it has been met with in many cases of pemphigus and chronic eczema, scleroderma, psoriasis, pellagra, lupus, urticaria, dermatitis herpetiformis, xeroderma pigmentosum, Hallopeau's dermatitis, epidermolysis bullosa hereditaria, herpes zoster, Duhring's disease and various skin affections produced by different vesicants, notably picric acid. The eosinophilia met with in the skin-diseases is of especial interest, because of the fact that Ehrlich believes that the substances produced by the disintegration of epithelial cells have a marked chemotactic effect upon the eosinophiles. We have demonstrated an eosinophilia in chronic eczema, pemphigus and epidermolysis bullosa.

An eosinophilia has been noted after the use of various drugs and poisons. Zappert, Ehrlich, Lazarus and Grawitz report a high grade of the eosinophilia after the use of tuberculin, and we have recently demonstrated a leucocytosis of 30,000 with an eosinophilia of 12 per cent. after the protracted use of acetanilid.

Among the large number of diseases in which a moderate eosinophilia has been noted we would mention two cases of Addison's disease studied by us and many cases of gout.

Thus a consideration of the experimental work which has been done in connection with the etiology of the eosinophiles and the clinical results obtained from the study of these cells justifies us, we believe, in reaching the following conclusions regarding the significance of these cells.

But before giving these conclusions let us briefly recapitulate the conditions in which an increase in these cells is noted:

1. Splenomyelogenous leucemia where besides

a marked increase in the ordinary or polymorphonuclear eosinophiles we find large numbers of mononuclear eosinophiles, the so-called eosinophilic myelocytes.

2. In bronchial asthma associated with the presence of enormous numbers of eosinophilic cells, often mononuclear in character, and of Charcot-Leyden crystals in the bronchial secretions.

3. In pemphigus, where an increase is frequently met with, while in the vesicles, if fresh, many eosinophiles are to be found, although in old vesicles, or those produced in this disease experimentally by chemical irritants, very few eosinophiles are to be found, as shown by Neusser, Kriebich, ourselves and others.

4. In various acute and chronic skin diseases, as shown by numerous observers as mentioned above, and here the extent of the eosinophilia seems to depend largely upon the extent of skin surface involved by the disease. These cases certainly favor Ehrlich's views that substances produced by the destruction and disintegration of the epithelial cells of the skin have a peculiar attraction for the eosinophiles.

5. In various diseases due to intestinal parasites, the most important being anchylostomiasis, where we have a marked anemia and considerable relative eosinophilia, with no or slight leucocytosis, as a rule, and trichinosis, where the leucocytosis is very marked and the eosinophilia very intense.

6. The post-febrile eosinophilia following the marked diminution of the eosinophiles usually met with during the course of the fever, the notable exception to this being scarlet fever, where eosinophilia is the rule, especially in the second and third weeks of cases terminating favorably.

7. In malignant tumors, where the condition is met with, but is by no means common. It is more likely to occur in those cases where cachexia is present.

8. Compensating eosinophilia seen after extirpation of the spleen.

9. Drug eosinophilia, of which our case of acetanilid eosinophilia is a most interesting example, and in which category the eosinophilia following the administration of camphor and cantharides must be placed.

10. The moderate eosinophilia sometimes met with in many diseases, as gout, gonorrhea, syphilis, malaria, rheumatism, and, we think we may add chorea and probably others of the functional neuroses.

The conflicting views regarding the origin and significance of these cells, and the large number of cases in which an increase, although often of but slight amount, has been met with, leaves the question of the value of eosinophilia diagnostically and prognostically in some doubt, and yet we feel warranted in claiming that in certain cases it is of great aid both in diagnosis and prognosis.

Thus its presence seems to differentiate scarlet fever from measles and malaria from typhoid fever in doubtful cases, while we feel that the rapidly increasing number of cases of trichinosis diagnosed by the finding of a marked eosinophilia associated with a marked leucocytosis is in itself of great value in differentiating this disease from atypical cases of rheumatism or typhoid fever.

Gout may be differentiated from tuberculosis where the eosinophiles are usually much decreased, while bronchial asthma may be easily distinguished from cardiac or renal asthma by the large number of eosinophiles in the blood and sputum in the former condition. The discovery of anchylostomiasis in our Southern States makes it extremely important that new means of diagnosis should be introduced, and undoubtedly the eosinophilia with severe anemia, almost constantly met with in this disease, is of great aid in diagnosing this disease, at present but rarely met with, from pernicious anemia.

As regards prognosis, in a number of diseases the percentage of the eosinophiles furnishes us real aid, as in scarlet fever, where a high count during the second and third weeks seems to be a favorable sign; in typhoid fever, where an early reappearance of the eosinophiles (these cells disappearing in the stage of continued fever) points to a favorable prognosis; in the anemias, where the presence of a slight eosinophilia is a good sign; in tuberculosis, where the presence of eosinophile cells in the sputum is regarded by many as favorable prognostically, and in various surgical conditions, in which, again, the presence of these cells in a condition of moderate increase is a favorable sign.

Thus in considering the diagnostic and prognostic value of the increase or decrease of the eosinophiles, let us admit that the percentage or absolute number of these cells present is of real value in the diagnosis or prognosis of a number of diseases, such as trichinosis, anchylostomiasis, leucemia, scarlet fever, bronchial asthma, tuberculosis, typhoid fever, malaria and various diseases of the skin and of the nervous system; let us collect as many facts regarding the changes and characteristics of these cells in as many diseases and pathological conditions as possible, so that from this great mass of material we may be able to arrive at definite conclusions regarding the significance of the eosinophiles, their mode of origin and their life history, and from this be able to make much more rational deductions as to their value in diagnosis and prognosis.

Sublamin in Treatment of Syphilis.—This preparation has been advanced to overcome the objections to the use of the bichloride of mercury in the injection treatment of syphilis. M. FRIEDLANDER (Deut. Aerzte Zeitschr., Feb. 15, 1903) has employed it in 15 cases presenting either hard chancres, secondary lesions, papular, tuberculous and ulcerating syphilides, or specific disease of the mouth, tongue, and larynx. About 280 injections of a 3.4-per-cent. solution were given. The effect was similar to that observed with sublimate injections but the local symptoms were much less severe and disappeared early. Secondary effects were not observed. He recommends the sublamin as a substitute for the sublimate as being more soluble, of an equal effect, and accompanied by less pain and induration.

THE MORBID ANATOMY AND PATHOLOGY OF TABES.*

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PART III: ANALYSIS OF 140 CASES OF LOCOMOTOR ATAXIA.

THE lesions of the disease known as tabes are by no means limited to the spinal cord, but as the essential pathological change seems to be a slowly progressive decay of that portion of the peripheral sensory neuron which courses within the posterior columns of the spinal cord, the intramedullary portion, the disease is universally described as a spinal cord disease. Tabes or locomotor ataxia is ordinarily defined as a disease of the posterior columns of the spinal cord, but this statement conveys an entirely inadequate idea of its morbid anatomy. Not only are widely separated lesions of considerable severity found in other parts of the nervous system, such as the peripheral nerves, but the constituents of the posterior columns are not equally or simultaneously affected. Moreover the degeneration of the posterior columns is to a considerable degree a secondary process. The endogenous fibers of the cord are not affected save secondarily. The pathogenesis of tabes is still far from being understood, nor is the point of departure of the morbid process and its mode of progression by any means satisfactorily known.

In this article I shall portray briefly the anatomical picture which one finds ordinarily in the tabetic spinal cord, basing my remarks (1) upon a study of three cords, the microscopical examination of which was undertaken for this purpose; (2) a brief review of the status of the pathogenesis of tabes and an enumeration of the theories which have been suggested and promulgated to explain the development of the disease, especially its development from syphilis.

The changes in the tabetic spinal cord vary in intensity and extent in different cases. In some instances the dorsal cord bears the brunt of the lesion, but in the vast majority of cases the dorso-lumbar cord is the predominant seat of the disease. Rarely the disease is most pronounced in the cervical segment and when it is we have the disease known as cervical or high tabes. The picture presented by the spinal cord in the early stages of tabes is very different from that presented by older cases.

The spinal cord taken from the body of an individual who has suffered from tabes for a number of years is invariably smaller than the normal cord and the posterior surface often presents a sunken-in appearance. The dura is usually normal. The pia is sometimes normal but as a rule it has lost its glisten and is thickened and slightly adherent to the posterior surface of the cord and occasionally to the lateral columns as well. Some investigators, and particularly Nageotte, claim that this meningitis is constant though variable, of the same nature as syphilitic meningitis, and that it is the cause of a peculiar neuritis of the posterior roots which is an essential lesion of tabes. This will be referred to later. When the cord is cut across in the fresh state the degeneration of the posterior columns is seen as pale, white streaks most conspicuous in the dorsal and lumbar regions. The posterior roots of the dorso-lumbar region are diminished in size and the posterior horns appear small in contrast with the anterior. When the finger is passed over the cord a varying increase of its consistency, especially in the posterior part, is readily made out. If the cord has been hardened in Muller's fluid, the degeneration of the posterior columns is readily visible on cross-section to the naked eye, and has the outline of a grayish triangle.

When sections of the spinal cord stained with Weigert's hematoxylin are examined microscopically striking changes are seen in the posterior columns. It depends upon the stage of the disease how completely the posterior columns and the posterior roots are decayed. In advanced cases the degeneration may be so complete that scarcely any healthy axis cylinders or collaterals remain. (See Fig. 3.) In other instances and especially in more recent cases, the lesion, which is usually spoken of as "sclerosis" may be confined to definite and restricted areas of the posterior columns which are often asymmetrical; for instance, the lesion may be much more extensive on one side of the cord than the other and it may vary in sections taken from juxtaposed levels. In the cervical cord the degeneration may involve the columns of Goll and Burdach to a very considerable part of their entire extent as represented in Fig. 3, but more frequently the column of Burdach is spared save in cervical tabes.

Fig. 1.

Section from the Sixth Dorsal Segment showing Degeneration Restricted to External Bandelettes of the columns of Burdach.

The seeming selection by the disease process of certain areas is explained by the fact that decay

* Part I of this series appeared in the MEDICAL NEWS of January 3 and 10; Part II on March 7 and 14.

of the posterior roots conditions the distribution of the lesion in the cord. There are areas in the posterior columns of the lumbar cord, and of the cervical cord as well, which remain uninvolved in early tabes. These are the so-called postero-external fields, areas which extend from the dorsomedial bundle on the posterior border of the spinal cord as far as the entering posterior root zone. They are often sharply defined from the degenerated areas (*i.e.*, it is an area limited on the inside by the column of Goll, posteriorly by the periphery, on the outside by the entering posterior root and anteriorly by the degenerated area in the middle part of the column of Burdach). This region does not remain absolutely intact even in the early cases and often is completely degenerated in the late and severe cases. It is generally believed that although it is made up largely of endogenous fibers that it also contains posterior root fibers. It is stated by Schmaus that this area in the lumbar cord is likely to be found intact when the sacral cord is not profoundly affected with the tabetic process, from which one may conclude that it is made up of fibers which ascend from the sacral cord and is therefore not affected more than the region from which it comes.

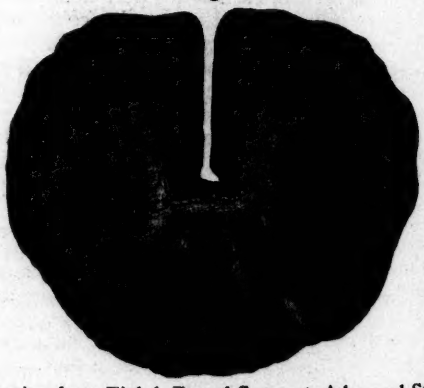
The lower dorsal, lumbar and sacral cord of a fairly recent case of tabes shows a degeneration of the posterior columns confined to that part of the column of Burdach which borders on the posterior horn and extending toward the periphery posteriorly (Fig. 2). The strips of degeneration have the appearance of thin bands and were called by Pierret who first described them "bandelettes externes" or external little bands. This area corresponds to the pathway of the intramedullary fibers of the posterior roots when they first enter the spinal cord and before they pass to the column of Goll or other tracts of the spinal cord in which they course to their destination.

It is well known that each fiber of the posterior root when it enters the spinal cord at any given level trends toward the middle and base of the posterior horn and ascends in this position for some distance, about one segment, and then turns inward to take up its position in the column or pathway in which it courses to its destination, principally the column of Goll. If the root-entrance zone, the "external bandelettes" and the column of Goll are diseased in the cervical region, in a case of tabes it shows that the root-entrance zone of the dorsolumbar region must be diseased, for the column of Goll in the cervical region is largely made up of fibers that constitute the root-entrance zone and the external bandelettes in the dorsolumbar region. The extent of the special area of degeneration in the column of Burdach that the French writers speak of as external bandelettes, will depend upon the amount of fibers that are involved. If the area of degeneration extends from the base of the posterior roots towards and nearly to the periphery, then the entire entering bundle is involved. Higher up in the cord these strips of degeneration are not to be made out.

In more advanced cases the disease causes a degeneration in the column of Lissauer, in the commissural zones, in the fasiculi whose collateral detach themselves from the external bandelettes to go to the anterior horns, the disappearance of those fibers is coincident clinically with the loss of the tendon-jerks, and in the inner half of the posterior columns, the fields extending in a medial direction up to the posterior longitudinal septum and causing what seems to be apparent uniform degeneration on each side of this (Fig. 2 and 3).

If the tabes is of the cervical region predominantly, *i.e.*, "high" tabes, naturally the pathological alterations will be most conspicuous in this region but in their distribution they are not unlike the lesions of the lower dorsal cord. When the brunt of the lesion is born by the dorsolumbar cord, the external bandelettes of the cervical cord are spared (Fig. 4), but when the specimen is from a case of cervical tabes these are degenerated as well as the columns of Goll. In the ordinary case

Fig. 2.



Section from Eighth Dorsal Segment, Advanced Stage of Tabes, showing Degeneration of Goll's Columns and of Anterior Portion of Burdach's Column even of the Ventral Field.

of tabes the lesions are of maximum severity in the dorsolumbar region. They increase from below upward, so that when the cervical cord is reached the posterior and internal part of the column of Goll in many instances is degenerated. Still, as I said above, there are a great many variations in the anatomical picture which a case of tabes may present. In the most classical form of tabes all the segments of the cord, even those that are juxtaposed, are not equally diseased and it is rare except in very old cases, to see anything like a uniform symmetrical degeneration of both sides of the cord.

The histological details of the disease-process one gets best from relatively recent and rapidly progressive cases. When the degenerated zones themselves are studied with a view to determine the character of the change that has gone on, it is seen that the lesions consist principally of a shrinkage, atrophy and decay of the axis cylinder and its sheath which is accompanied by some pro-

liferation of neuroglia. The neuroglia and the blood vessels are very slightly affected in tabes. Unless the course of the disease has been very rapid, there are but few neuroglia nuclei to be made out and very few granular bodies; thus the process is one of simple parenchymatous degeneration, an atrophy of the nerve tubules. Axis cylinders are found in various stages of destruction, some of them are swollen so that they have a hypertrophic appearance, others are irregular in contour and puffed out, here shrunken, there swollen, while others are shrunken and twisted. Here and there holes of different or greater or lesser size, some of them containing fat globules or myeline fragments are to be seen. If the pia is diseased and thickened the connective tissue prolongations which it sends into the posterior columns may change the appearance of the picture somewhat. The homogeneity of the process is the most striking feature. There are no signs of elementary lesions, inflammatory or productive, no foci of disease; no indications of diapadesis.

Fig. 3.

Section from Second Lumbar Segment, showing Apparently Complete Degeneration of the Posterior Columns.

It has been stated above that certain parts of the posterior columns are very little affected, *i.e.*, they are very slightly affected in contrast with the external part of the column of Burdach, the entering posterior root zone and the column of Goll. These zones that are thus relatively spared, are zones that are constituted largely of fibers arising in the cord and therefore called endogenous fibers. In the dorsal and cervical regions these zones are the commissural zones uniting the gray horns, the posterior lateral border of the posterior column and the little columns known as Schultze's "comma" while in the lumbar region they are the same commissural zone and those areas that have been described as the central ovale of Flechsig and the triangle of Gombault and Phillipe. But these are by no means always spared. The degeneration may involve everything in the posterior columns. In cases of incipient tabes the lesions of the cord may be restricted to a very narrow area. This is well illustrated by a case recently recorded by Cassirer and Strauss. The only symptom of tabes which the patient had was Argyll-Robertson pupil. On microscopical examination there was found complete symmetrical degeneration of a portion of the intramedullary prolongations of the eighth dorsal roots and in the upper part of the cervical cord and lower oblongata degeneration of Bechterew's olivary bundle.

Although affection of the lateral columns of the spinal cord is not a part of the lesions of tabes, they are frequently found affected to a greater or lesser degree. In some instances the disseminated foci of degeneration to be found here occur in connection with vascular and cachectic states. Occasionally there is found slight degeneration of the direct cerebellar tracts and Gower's tract. These changes are probably secondary to changes in the cells of Clarke's column. (Oppenheim and Siemerling).

The changes in the cord are not confined to the white matter, the gray matter is profoundly affected; especially the posterior horns. The fine fibers constituting the gelatinous substance, and the spongy portion of the gelatinous substance and the zone of Lissauer are degenerated in every case. The spongy substance proper of the posterior horns, *i.e.*, the portion adjoining the central part of the gray substance is not so profoundly affected. The reflex collaterals of the posterior roots and the collaterals of the posterior columns practically disappear. These changes give the gelatinous substance a rarefied appearance. This is well illustrated by Figs. 5 and 7, Clarke's column, which is constituted by a group of cells situated just within the neck of the posterior horns in the dorsal region and whose axones extend upward to the cerebellum constituting the direct cerebellar tract shows alterations in nearly every case of tabes. The cells themselves are not disordered, neither are their axones, but fibers that come from the posterior roots to ramify around the cells of Clarke's columns are seen, when stained with medullary sheath stains, to have the typical appearance of degeneration (Fig. 7).

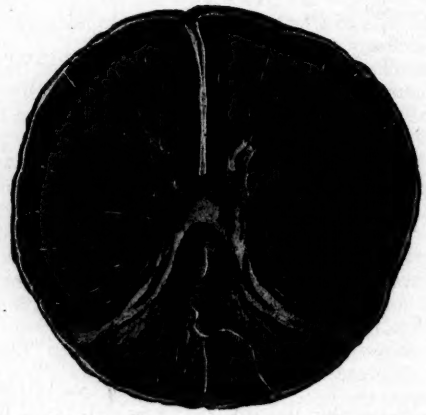
Fig. 4.

Section from Fourth Cervical, showing Degeneration of Columns of Goll and of Endogenous Fibers in Columns of Burdach.

The state of the anterior horns is in marked contrast with that of the posterior. Unless the case is a very ancient one there are no changes whatsoever. If it is, the anterior horns may present a rarefied appearance, due largely to the existence of spaces out of which cells have dropped, to enlargement of the perivascular spaces and to alterations in the coats of the blood-vessels. The

anterior horn cells, when stained according to Nissl's method, may show chromatolysis, anomalous pigmentation, and even eccentricity of the nucleus. But these changes are no longer considered immutable evidence of disease. Of course, in tabes complicated with progressive muscular atrophy, there may be most extensive lesions of the anterior horn cells, if the atrophy of the muscles is of spinal origin. Here it should be said that in the vast majority of cases of tabes with muscular atrophy that have been reported, the

Fig. 5.



Sixth Dorsal. To show Degeneration of the Posterior Horns, "the External Bandelettes" and the Columns of Goll.

cells of the anterior horns have been found intact. (See *Journal of Nervous and Mental Disease*, June, 1903.) A few cases of tabes with bulbar involvement have been reported in which at autopsy, changes in nuclei from which arise the nerves that supply muscles that were atrophied during life have been found. The cranial nerves that are most frequently affected are the optic, the trigeminal and the glossopharyngeal. The optic nerve is atrophied in 14 per cent. of all cases of tabes (See article on Symptomatology, MEDICAL NEWS, March 7 and 14, 1903). The changes in the optic nerve are those characteristic of primary decay of the nerve fibers beginning in the ganglion cells of the retina and progressing toward the optic chiasm and external geniculate bodies. There is no evidence whatsoever of inflammation. The nerve fibers of the human retina are medullated in exceptional instances only. But a case of tabes has been described in an individual whose nerve fibers were medullated and in this case the medullation disappeared early. In cases wherein there has been paralysis of the motor cranial nerves, of protracted duration, such as progressive paralysis of the eye muscles, hemiatrophy of the tongue, there is usually found degeneration of the cells of the corresponding nuclei, although these symptoms may be dependent upon a lesion of the corresponding peripheral nerve.

The lesions of tabes that are next most important to those of the posterior columns are found in the posterior roots and the ganglia which are developed upon them in the intervertebral spaces, the posterior spinal ganglia. The posterior roots of the dorsolumbar cord from a typical case of tabes are the seat of profound alterations; scarcely an entirely normal fiber is to be found. The fibers disappear, lose their myelin sheaths or are thin and irregular in outline, which is due to changes going on irregularly in the intra-annular segments. Many entirely empty sheaths of Schwann are to be seen, indicative of the complete disappearance of the axis-cylinders. In other fibers the sheath of Schwann has disappeared and the axis-cylinder appears like a very fine thread.

Thomas and Hauser have been able to trace the atrophy in the posterior root into the interior of the ganglion, but not as far as the cells of origin. But in most cases it cannot be traced thus far. As a matter of fact, the atrophy diminishes as it is traced into the ganglion. The affection of the roots is distinctly segmentary there being no uniform affection of long stretches of it. This has been shown recently by Phillipe.

The degeneration of the fibers is not that characteristic of Wallerain degeneration, on the contrary, it is distinctly interannular; the process being one of simple atrophy. All writers are agreed that there is a most intimate relationship between the atrophy of the posterior roots, and the "sclerosis" of the posterior columns. It has been shown by experimental destruction of the roots as well as by study of the ascending degenerations that follows pressure upon the roots, such as upon the cauda equina, that the tracts of the spinal cord that are diseased correspond exactly with those

Fig. 6.

Section from First Lumbar Segment to show Typical Alteration of the Posterior Horns and Posterior Columns in Tabes.

involved in tabes, especially in early tabes, that is with the primary lesions of tabes and not the secondary lesions of endogenous fibers. It does not follow, however, that this admission is a subscription to the theory that the original lesion of tabes is in the posterior roots and that the changes in the posterior columns which constitutes the most striking anatomical feature of tabes, is secondary.

The alterations of the cells and the root fibers of the spinal ganglia are inconstant and irregular. A few years ago after Oppenheim, Siemerling, Stroebe, Wollenberg and other German neuro-

pathologists showed that the cells of spinal ganglia taken from tabetic patients were not infrequently the seat of alteration in structure and conformation many assumed that these alterations were responsible for the decay of the posterior rooots and their intramedullary prolongations which constitutes tabes. In other words, that the starting point of the tabetic lesion was in the spinal ganglia and that the changes in the posterior columns of the cord were secondary, the destruction being by process of Wallerian degeneration. As a matter of fact, there is no definite relationship between the amount and degree of alteration to be found in the posterior ganglia, which, by the way, is often very slight and confined to a few cells in the superior pole of the ganglion and the alterations of the posterior roots. Different investigators have found different and

Fig. 7.

To Illustrate Degeneration of the Posterior Horn and Posterior Root.

most inconstant lesions varying from foci of hemorrhage and degeneration of the different coats of the blood-vessels, up to increase of the connective tissue, constituting sclerosis with cytological change. Deformity of the cells, vacuolization, cloudiness, and pigmentary surcharge are the commonest changes in the nerve cells, but all of them may be absent.

In the majority of the spinal ganglia that were examined by Thomas and Hauser the cells appeared to be normal. In some of them the cellular alterations were quite pronounced varying from simple atrophy to disappearance. They found that simultaneously with the atrophy of the cell the ganglionary capsules proliferate to such a degree that they end by filling the place occupied by the cell. It is quite difficult to seize the beginning of cellular atrophy, for in normal ganglia the dimensions of the cells are very different. These lesions, however, are not constant, but they are much more frequent and more intense when the fibers of the posterior root are atrophied in the subganglionary course and in the ganglion itself. Working with Nissl's method Marinesco has observed various lesions: Disintegration, pallor and disappearance of chromatic granulations from the large clear cells; sometimes retraction, homogeneous transformation with preservation of the volume, or atrophy of the nucleus; more rarely atrophy of the cell body. Marinesco does not accord much importance to this. In fact the cells of the spinal ganglia undergo very quickly alterations following intoxications and infections, and as they rarely present a normal aspect in the adult Marinesco concludes that sclerosis of the posterior columns of the spinal cord is not dependent upon these lesions. It is more than likely that all the alterations that have been described as occurring in the spinal ganglia in cases of tabes are secondary, either to disease of the pia or to alteration of the posterior roots in their intramedullary and supra-ganglionic course.

The peripheral nerves are often found diseased in tabes. Especially the cutaneous nerves of the lower extremities. Westphal, Pierret, Dejerine, Pitres et Vaillard, Oppenheim and Siemerling, Joffroy and Achard, Nonne and others have studied these concomitant lesions of tabes. No one save Nonne has found them constantly, but as S. Mayer has pointed out, the alterations in many cases do not surpass those sometimes found in normal nerves.

Changes of similar nature are often found in the motor nerves and in the mixed nerves. The anatomical process, which is that of neuritis, reminds of the change in the posterior roots and is probably of the same nature. Cases of tabes are occasionally met with in which muscular atrophy or paralysis of a group of muscles is a symptom. In such cases it is not improbable that a neuritis of motor nerves is responsible. In very rare instances one of the large nerve trunks, such as the sciatic, ulnar and musculo-spiral is found diseased, but this like disease of the anterior roots is a very uncommon occurrence.

There have been a few cases recorded such as the writers in the *Journal of Nervous and Mental Disease*, June, 1903, in which most profound and extensive degeneration of the nerves and muscles were found and upon which the muscular atrophy was dependent.

These changes of the peripheral nerves, have been considered by some to be suggestive that the entire peripheral sensory neuron is the seat of the disease-process in tabes. Although the nature of the lesion in the peripheral nerves is similar to that of the posterior roots, the process is in no way to be compared either in constancy or intensity with that of the posterior roots.

Changes in other parts of the nervous system have been described by different investigators; in the cerebrum by Jendrassik, in the cerebellum, especially in the corpus dentatum and the fibers going to these nuclei by Jellinek, in the splanchnic and thoracic sympathetic by Roux, but it is more

than likely that those of the two first are incidental, not an integral part of the anatomical picture produced by tabes. The changes in the sympathetic system and the representation of the sympathetic system in the spinal cord is another matter. It is not improbable that future investigation will reveal lesions primary or secondary of this important system.

Klippel has found pathological alteration of the ganglia of the cranial nerves that correspond to spinal ganglia, *i.e.*, the ganglion of Andersch of the glossopharyngeal nerve and the ganglion of Gasser of the fifth nerve, and also of the hippocampal gyrus. He is inclined therefore to the belief that tabes is a disease of the centripetal system of neurons. These changes described by Klippel should not be taken too seriously for similar ones are found in other protracted nervous diseases.

(To be Continued.)

LEUCOPLASIA IN SECONDARY SYPHILIS.[1]

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LEUCOPLASIA rarely occurs in the secondary stages of syphilis.[2] In fact up till a very short time ago it was held to be impossible for it to appear at all as a result of recently acquired syphilis.[3] Now this view is changed and leucoplasia of secondary syphilis is an ascertained fact. I wish to present to you this evening a man suffering from this interesting lesion.

The patient, a Scotchman, thirty-seven years of age, came to the University Clinic, August 23, 1901. Except for rheumatism, the history he gives of his family is good. Both his father and mother are alive. His mother is seventy-two years of age and suffers from sciatica, and for years has had rheumatism of the hands and feet. An older brother has rheumatism of the left shoulder. The patient said that in August, 1900, while in Manila, P. I., he had a sore on the lower surface of the penis near the scrotum which was long in healing, but finally disappeared under treatment with carbolic ointment. In October of the same year he was bedridden with rheumatism of the right ankle. About February, 1901, he had a universal rash and sores in the mouth, presumably the first symptoms of constitutional syphilis. In April, May and June his hair fell out so copiously that he was afraid he would become bald, and there were sores in his scalp. Sometime after the first appearance of the symptoms of constitutional syphilis the patient noticed a decided dent or hollow on the radial margin of the nail of the middle finger of the right hand, and the nail of the right great toe began to grow crumbly and brittle at its free margin. By crumbling and breaking off, this toe nail retreated back as far as the middle of the nail bed. Lately it has begun to grow out again.

When he came to the clinic he had a generalized lenticulopapular eruption which was arranged in groups. The papules were very large and there were six to a dozen of them in each group. He had about a dozen such groups over the back, and about half a dozen over the chest and abdomen. As a result of this eruption he has a number of scars, and those of the lower extremities are still stained a deep coffee brown. There was no demonstrable enlargement of the lymphatic nodules.

The most striking and troublesome lesions, however, were in the mouth, where there were a great number of mucous patches. The dorsum of the tongue was covered with large flat papules. During our entire observation of the patient the mucous membrane of the mouth and tongue has shown a more than ordinary tendency to irritative lesions, and what the patient has suffered is unrecountable. When the suffering would become extreme he would take several drinks of whisky neat, which, while it temporarily assuaged the pain, ultimately added to the irritation.

There is a deep furrow down the middle of the tongue, which is probably a natural feature. The dorsum of the tongue posteriorly is covered with a coating such as is seen in indigestion. Over a large part of the anterior surface of the dorsum of the tongue there is a white or opalescent coating which is particularly dense, solid, smooth, and white in two patches. These patches are situated symmetrically one on each side of the median line well out toward the edges of the tongue, where there were formerly two persistent mucous patches. These particular mucous patches, which will be mentioned later on when we come to speaking about treatment, were situated in leucoplasic areas, and were covered by a dirty gray coating. With a low magnifying power the papillæ of most of the dorsum of the tongue can be seen to be covered with a dense white covering, as if a horny change had taken place in the epithelium, constituting a keratosis.

The tongue is not at present nearly so painful as it used to be. At one time it was spontaneously painful. Now it is only unduly sensitive and tender to such things as hot drinks, pepper, spices, and to touch from food or the teeth. His speech is a little thick, and one can appericate by it that the tongue is not as supple and flexible as it should be. The tongue does not feel to be indurated. The tissues of the floor of the mouth appear to be fuller than normal, but this the patient says is a family characteristic, and not a symptom of disease. There is, however, some enlargement of the lymphatic nodules under the jaw.

[1] Patient demonstrated before the California Academy of Medicine, Jan. 27, 1903, and before the Society of German Physicians, Feb. 3, 1903.

[2] Danlos, in reporting a case of leucoplasia of the tongue in secondary syphilis, said he had searched the literature up to that time without finding any reference to it.—*An. de Derm. et de Syph.*, Serie III, Tome IX, page 264, March 10, 1898.

[3] Fournier, in the discussion on the case reported by Danlos, said he had formerly held the opinion that leucoplasia, when a result of syphilis, was a late manifestation, but now he recognized also that it does occur in the early stages of the disease— *An. de Derm. et de Syph.*, Serie III, Tome IX, page 265.

Benard, in the article on leucoplasia in the *Practique Dermatologique*, par E. Besnier, L. Brocq and L. Jacquet, says that leucoplasia may occur both in the early and in the late stages of syphilis, but by far most frequently in the late stages.

In spite of repeated warnings the patient continues to smoke about two or three cigars a day, and his teeth are not kept in good condition. The etiological importance of tobacco in leucoplasia has long been recognized. Tobacco alone can cause the disease, and in a list of etiological factors recently given by Benard[4] tobacco is rated as the most important local cause.

Benard in the above mentioned article[5] draws attention to the fact that leucoplasia of the tongue in secondary syphilis may arise simply as such from a healthy appearing tongue, or it may follow a superficial glossitis or mucous patches of the tongue. The latter was its mode of origin in the present instance. In this case the slow subsidence from an intense inflammatory to the present indolent process could be followed. When the patient first came to the clinic the appearance of the back of the tongue with its thickly placed flat papules was most striking. It was the "dos de crapaud," the toad's back of the French writers. The papules slowly subsided, giving place to an acute superficial glossitis. At this stage he had the bald smooth tongue of secondary syphilis, with numerous and frequently recurring mucous patches. As the activity of the inflammatory process subsided the leucoplasia appeared, and the mucous patches became less and less frequent, until now there are scarcely any, and the few that appear are usually situated on the inner surface of the lips or cheeks. As may be inferred from the foregoing history the first appearance of the leucoplasia was very insidious, and the date of it is hard to fix, but approximately it begun about the middle of the year 1902, or about one year and eight months after the appearance of the chancre.

The diagnosis of leucoplasia of the tongue is an important matter, for there are affections that closely resemble it. In the first place this is not a mucous patch. A mucous patch would be more active, more moist, more painful, and more changeeable in its appearance. It was indeed very interesting in this case to see the gradual subsidence of the mucous patches, and the equally gradual appearance of the leucoplasia.

It is not lichen planus. Lichen planus would in all probability be thicker than the present leucoplasia, and would also likely be accompanied by lichen planus of the cutaneous surface.

The prognosis of recent leucoplasia arising in the course of secondary syphilis is better than in leucoplasia in general. Barbe[6] and Gaucher[7] both secured, through treatment with mercury, a disappearance of the lesion. Although the leucoplasia in the present instance is slowly improving, and the tongue is becoming less irritable, yet with the continuance of smoking there is not great hope of a complete cure. It will also be noticed that in the present case there is not one but several etiologic factors all congruing to a natural close, leucoplasia. Two of these factors are constiutional; arthritism as shown by the family history, the attack of rheumatism and the lumbago, and syphilis. And three of them are local; smoking, ill-kept teeth, and alcohol. Latterly we have reason to believe alcohol is only sparingly taken. The leucoplasia here may gradually settle down to the more chronic leathery form of the disease, and from this go slowly on to the final development of epithelioma of the tongue.

It is interesting to note that three out of the four cases hitherto reported as leucoplasia arising in secondary syphilis have occurred in women.[8] Leucoplasia in general is more frequent in men than in women.[9] Too few cases have yet been recorded to generalize from, but it is remarkable that it should have occurred so frequently in women, and also that the lesion was cured, in at least two instances, after a short treatment. These facts would indicate an essential difference between some of these cases of leucoplasia and leucoplasia in general.[10]

The first treatment the patient received for his syphilis began on entering the University Clinic, Aug. 23, 1901, about one year after he first noticed the chancre. Mercury was at first given tentatively, because we were only able to see the patient about once every two weeks, and we feared to cause a mercurial stomatitis, and thereby to increase the irritation in the mouth. Because we felt constrained to give small doses of mercury, we added iodide of potash as an aid in combating the syphilitic virus. Later he was put on mercurial inunctions with a hypodermic injection of a centigram of bichloride of mercury once a week when he came to the city. As soon as possible, however, he was put exclusively on hypodermic injections of corrosive sublimate, as being the most effective remedy in such affections.

Mercury is almost universally conceded to be a more powerful antisyphilitic drug than iodide of potash, and when given hypodermically it is less irritating to the alimentary canal than when given by the mouth, and avoidance of irritation is of importance in these cases. Barbe cured his case of leucoplasia of the tongue in secondary syphilis, above mentioned, by giving injections of a soluble mercurial salt intramuscularly. Although by some observers calomel or some other insoluble mercurial is preferred to the soluble

[4] The list of causes reads as follows: Syphilis, arthritism, nicotinism, excessive mercurial treatment, alcohol, spices, vinegar, unclean, irregular or absent teeth, hot drinks, etc. Benard also believes that syphilis causes leucoplasia only through its irritative action on the tissues, and that therefore it is a parasyphilide, not a true syphilide. *La Pratique Dermatologique*, par Besnier, Brocq et Jacquet, Tome II, pages 1,220-1,221.

[5] *La Pratique Dermatologique*, par Besnier, Brocq et Jacquet, Tome II, page 1,020.

[6] *Ann. de Derm. et de Syph.*, Serie III, Tome IX, page 571. Used injections of the cyanide of mercury.

[7] *Ann. de Derm. et de Syph.*, Serie IV, Tome III, page 268. Used injections of mercuric benzoate.

[8] Danlos' case, *Ann. de Derm. et de Syph.*, Serie III, Tome IX, page 264; Barbe's case, *Ann. de Derm. et de Syph.*, Serie III, Tome IX, page 570; Gaucher and Barbe's case, *Ann. de Derm. et de Syph.*, Serie IV., Tome II, page 268; Danlos' second case, *Ann. de Derm. et de Syph.*, Serie IV, Tome II, Page 631.

[9] Of a list of cases of leucoplasia of the tongue, collected by A. Neisser, both from his own personal observations, and from the reports of authors, 547 were of men and only 24 were of women. As Neisser remarks, the difference in these figures does not at all correspond to the difference in the occurrence of syphilis in men and women. Leukoplakie und Gumma der Zunge, von A. Neisser. Neisser's stereoscopischer medicinischer Atlas, Neunte Lieferung.

[10] The lesion disappeared in Barbe's case after six injections of cyanide of mercury, and in Gaucher and Barbe's case in less than two weeks under subcutaneous injections of benzoate of mercury (2 cgr. a day).

salts yet the bichloride was the salt used in this case. There are two drawbacks to calomel or the other insoluble mercurials as injections, their painfulness and the possibility of killing the patient, either by embolism, or by too rapid absorption of the drug. For the past five months the patient has resided in the city and has been receiving one or two centigrams of bichloride of mercury hypodermically three times a week. Locally the tongue has been swabbed with a ten per cent. solution of chromic acid. The above mentioned persistent mucous patches were induced to heal by scrubbing them with a strong (five per cent.) solution of bichloride of mercury in alcohol. It was considered very important to secure healing of them, for fear they should become the starting point of epithelioma. The applications of sublimate were only employed as a necessity, and no further than to secure a healing of the ulcer, because both severe mecurial treatment, with its attendant buccal irritation, and severe cauterization have been taxed, and probably justly, as among the causes of leucoplasia.

MEDICAL PROGRESS.

SURGERY.

The Suppurating Abdominal Wound.—Mural abscess is one of the most troublesome complications following abdominal section to which WM. E. DARNALL (Am. Gyn., March, 1903) finds but little attention given in text-books on surgery. The cause of such suppuration is not always clear. Probably the lack of care in preserving the vitality of the tissues is a factor. It occurs sometimes, however, when every possible precaution has been taken and the incision has been united in the most approved manner. Causes that undoubtedly predispose to it are the bruising of the fatty layers by rough handling or metal retractors, carelessness in checking bleeding points in the incision, thus allowing small lacunæ of blood to form, which offer suitable focus for infection; the conveying of infection through the skin by the introduction of through and through sutures from the surface of the skin inward, and the using of non-absorbable suture material. Four or five days after the operation the symptoms first show themselves. And then as an abscess. In some cases the abscess is small and it may heal in a few days after the pus is evacuated. In others the large wound cavity may continue to discharge for weeks. When the abscess is deep down between the muscles and the peritoneum the diagnosis may be confused with localized infection about the pedicle of a pelvic tumor. The superficial character of the swelling, however, usually renders the diagnosis clear. If the abscess is discovered early the removal of one or two sutures and the evacuation of the pus may restrict the destructive process. In a large proportion of the cases, however, the suppuration travels the whole length of the incision, making it necessary to open the whole length of the incision and to convert the abscess into a wide open field. Ordinarily these wounds are permitted to heal by granulation, which process requires many weeks of careful dressing. Dr. Darnall has devised the following method of closing such a wound. The patient is given a few whiffs of the anesthetic. The edges of the incision are then gone over lightly with a curette merely to freshen up the granulations. In the bottom of the wound is then placed a narrow strip of iodoformized gauze or a few strands of silkworm gut for drainage. A strip of zinc oxide plaster about six cm. wide is now laid on each side of the incision for about two cm. from its margin, and interrupted sutures are passed between the inner edges of the adhesive plaster across the incision without penetrating the skin. An assistant brings the edges of the incision together over the drain by using pressure from each side of the wound. The sutures are now tied tightly across the incision. The two sides of the incision being closely approximated by this means, union takes place promptly, and when the drain is removed only a straight line scar is left.

Hypertrophy of the Synovial Fringes of the Knee-Joint.—Very little consideration has thus far been given to this condition as an independent disease, and its description has usually been included in that of floating cartilage, internal derangement of the knee-joint and chronic synovitis. E. G. ABBOTT (Jour. Am. Med. Asso., April 25, 1903) reports 12 typical cases and discusses their surgical aspects. The etiology is obscure. In a few cases traumatism plays an important part, in others no injury can be traced, but it seems very probable that the condition may be due to a weakened arch of the foot. The latter prevents fixation of the tibia and there is a consequent tendency to a stretching of the ligaments of the knee. A weak, pronated foot is very closely associated with many cases of the disease and here the use of the plate to support the arch of the foot has been of great service in remedying the trouble in the knee joint. Pathologically the disease consists of a nodular enlargement of the synovial fringes which project into the joint, with more or less thickening of the membrane. There is fluid present in a few cases. No traces of bacteria can be found. The first symptom is usually some difficulty in walking, there may even be a sudden pain which is bad enough to cause the patient to fall. An acute synovitis may be present for a time and then subside. The condition grows worse until there is a partial or complete loss of function in the joint. In some cases inability to extend the leg appears, and the quadriceps muscle atrophies. Examination shows a slight bulging of the thickened membrane on either side of the patella tendon, and a little higher up the small portions of the membrane can be easily felt under the finger. The joint shows no redness or heat, except in acute attacks. There is no crepitus present. The ligaments are lax and some lateral motion is possible. The treatment is mechanical and operative. The cause should first be ascertained, whether trauma or relaxed ligaments. The mechanical treatment consists in correcting any condition that may exist which tends to strain the muscles and ligaments of the joint. Hot air applied every other day and strapping with adhesive plaster are of benefit. When flatfoot is present, a plate will aid in bringing the joint surfaces into normal apposition, and by fixing the foot the knee is made more stable. A brace which limits motion in cases where the ligaments are lax, is very useful. In the operative treatment, the joint may be exposed by a U-shaped incision, but the patella tendon need not be divided. The fringes are then removed and the incision closed, care being taken to approximate the synovial surfaces. The limb is then kept in plaster for two weeks, after which motion is commenced.

Osteoplastic Amputations at the Knee.—Operations derived from the amputations of Gritti have the general faults inherent to these interventions in being more complicated than simple amputations of the thigh or subcondylar amputations. They appear to have the following advantages, however, according to J. A. BUSSIERE (Rev. de Chir., March, 1903). His patients have been able to walk continuously and protractedly

upon the patella. The patella was fixed in a good position, so that pressure was localized upon all its anterior surface and by various modifications, the tissue there becomes accustomed to pressure, perhaps by the formation of a bursa, which is an advantage in the wearing of artificial limbs. Finally, there was no wasting, no tenderness, no retraction, and no conicity of the stump in the result. Compared with simple amputation of the thigh, the advantages of this operation are: Somewhat less danger in that the section is relatively further away from the trunk; a longer stump, sometimes by 8 or 10 cm., possibility of the pressure of walking on this stump; more easy use of artificial limbs because the muscles of the thigh are less damaged; preservation of the muscles and their tendons, which gives greater power and wider mobility to the thigh; and finally, section of the bone in changed spongy tissues below the medullary canal gives less likelihood of conicity. The subcondylar amputation is the only one which may be compared to Gritti without disadvantage. Both of these involve a disarticulation at the knee and each may have its own indications, according to the degree of damage which necessitates the sacrifice of the limb at the joint or through the condyle and the femur.

Results of Decapsulation of the Kidney.—In a study of the changes noted in the urinary and peri-urinary tissues of dogs after decapsulations of the kidneys, the following are the conclusions offered by H. A. JOHNSON (Ann. of Surg., April, 1903). The capsule of the normal kidney consists of two distinct layers, an outer and thicker and an inner and thinner capsule. The latter is a direct continuation of the intertubular connective tissue. In the operation of decapsulation, the outer layer only is removed, leaving the inner lacerated but adherent to the surface of the organ. At first an exudate appears on the free surface of the kidney, which, with the remains of the inner layer, finally becomes a fibrous investment, resembling the normal capsule in that it strips readily, with the passage of time becoming more and more firm. Microscopical examination shows that in some cases this is thicker and in other cases thinner than the original capsule. The former is more generally true. Variations in thickness in the same specimen also occur. Albarran and Bernard in experimenting on rabbits observed the formation of the new capsule up to six months, and found it always thicker than the original after two months. The structure at least up to three and a half months is not differentiated into these layers, but is one homogeneous fibrous tissue. It will also form under adhesions, and may be recognized as distinct from them both microscopically and macroscopically. There is sometimes an infiltration with round cells and proliferation of the intertubular connective tissue of the cortex, without, however, affecting the glomeruli. The dogs in whom these changes were noted remained perfectly well as far as was shown by appetite, strength and playfulness. A most important observation is the fact that in no case was there any considerable anastomosis between the urinary and the peri-urinary blood vessels. In one dog, at the same time decapsulation of one kidney was performed, the urinary artery of the other was ligated. This presumably called for increased activity in the circulation of the other kidney. It was all made up, however, by the increased size of the urinary artery and vein, and not through any peripheral anastomosis.

The Surgical Treatment of Anuria.—In a study of the subject of anuria, A. D. BEVAN (Ann. of Surg., April, 1903) offers the following brief discussion: Total suppression of urine occurs, (1) from mechanical obstruction of the ureter of a single functionating kidney of an individual when the other kidney is either totally absent or totally destroyed by disease; (2) it arises from mechanical obstruction of one ureter in an individual possessing two functionating kidneys with increased intra-urinary pressure on the obstructed side, which, by reflex nerve action, prevents the unobstructed kidney from acting. This is renal reflex anuria. After a nephrotomy the involvement of the various nerves in the pedicle may produce a reflex anuria. (3) It may be due to a trauma of both kidneys, which, for a time, or until death is followed by complete suppression of function, or to trauma of one kidney, which, the reflex action, so affects the uninjured kidney that complete anuria results. (4) Another cause is acute nephritis, as sometimes seen in scarlet fever and other forms of septicemia. (5) It arises also from obstruction of practically all kidney tissue, as the result of such chronic diseases as tuberculosis, cystitis, degeneration of the kidney and the like. Active factors in exciting anuria are certain poisons, of which phosphorus, lead, turpentine, ether and chloroform are examples. (6) Urinary fever, resulting from the passage of a sound or catheter is a peculiar condition often causing that symptom. (7) In the peculiar polymorphous symptom-complex called hysteria usually acute anuria may arise. Final conclusions concerning this condition are, (*a*) There is great clinical importance in recognizing the three forms, obstructive, reflex and non-obstructive; (*b*) there is urgent necessity of surgical interference in the obstructive, and reflex forms, and there may be virtue in it in the non-obstructive cases; (*c*) in the first two varieties as named, a rapid nephrotomy should be done on the side of pain, tenderness and rigidity; if necessary, the operation should be bilateral; (*d*) nitrous oxide anesthesia is probably to be preferred; (*e*) time-consuming operations, which permanently relieve the obstruction, are to be postponed to a later period, when the patient shall have recovered from his anuria; (*f*) an operation should be done early, certainly by the beginning of the third day.

Primary Carcinoma of the Appendix.—Careful study of this subject offers the following conclusions, according to A. W. ELTING (Ann. of Surg., April, 1903). Primary carcinoma of the appendix is not so rare as hitherto supposed. Every appendix removed, at autopsy or operation, if at all diseased, should be examined most carefully with reference to this point. The relationship of primary carcinoma to chronic appendicitis, especially of the obliterated type, seems to be definitely established. Primary carcinoma of the appendix shows a tendency to develop at a comparatively early period of life, and it does not show a marked tendency to extension or secondary appendicitis. Symptoms of primary carcinoma in this viscus are those of chronic appendicitis. A definite diagnosis is in the majority of cases impossible. The treatment of the disease should always be operative.

Diagnosis of Intestinal Injury.—Abdominal contusion so frequently results in injury to the contents of that cavity that the following points are worthy of note. R. G. LECONTE (Ann. of Surg., April, 1903) says that the rapidity with which grave symptoms develop depends upon three factors, namely (1) the amount of food present in the alimentary canal; when the stomach or intestine contains food or liquid feces, immediate leakage takes place, with a correspondingly rapid development of symptoms. If, however, the injury occurs after a long fast, there may be scarcely a symptom for many hours, because there are then no intestinal contents to escape and because also the usual bacteria of the mucous membrane are diminished in number by fasting. (2) A wound in the upper portion of the alimentary tract and part of the stomach or

one at the beginning of the jejunum will give symptoms of danger less rapidly than one at the end of the ileum, owing to the fact that the upper portion of the intestinal tract contains comparatively fewer and less virulent organisms than the lower portion. (3) When the damage has not had the result of immediate perforation, as in a mesenteric injury or an injury to one of the loops of the bowel, grave symptoms may not occur for days, weeks or even months.

Primary Tuberculosis of the Breast.—The diagnosis of tuberculosis of the breast, according to W. S. SCHLEY (Ann. of Surg., April, 1903), cannot, in its earlier stages, be made from its clinical symptoms and macroscopic appearance. This is particularly true of the discrete form, and when enlarged glands or evidence of a tuberculous focus elsewhere are lacking. If the disease is well advanced or tuberculosis exists or has existed in some other part, there is less difficulty. In the majority of cases reported in literature, the diagnosis was not made prior to operation. The tumor may be mistaken for a simple cyst, fibro-adenoma, carcinoma, sarcoma and actinomycosis. It may also be necessary to consider chronic interstitial mastitis. A simple cyst is usually more circumscribed, fluctuates earlier, is painless and has no enlarged glands; aspiration demonstrates their character. Fibro-adenoma is more difficult and is apt to occur in young adults, and be of slow growth. Fibroma is more common, more distinctly movable in the gland and the axilla is free. It is possible to find tuberculosis engrafted upon such a simple adenoma. In the early stages of carcinoma there may be likewise confusion, but as a rule this disease begins later in life, is of more rapid progress and more painful. The glands of the axilla do not suppurate and are not painful at so early a date. Tuberculosis and carcinoma have been known to coexist in the breast. Sarcoma grows rapidly and involves the skin earlier. With sarcoma, the cutaneous veins are apt to be enlarged. Gumma is recognized by its history, by coincident lesions and by its responsiveness to antisyphilitic treatment. Diffuse syphilitic mastitis in actinomycosis the glands of the axilla are not usually enlarged. The fresh granulations of the fungus are formed. In chronic mastitis there is a lack of granular ulcerations in the axilla. The field is less that of a mass and more that of a spread out or diffuse process. The excision of a small piece of such tumors with a microscopical examination is necessary for the diagnosis. Of the methods of treatment employed in the cases reported in literature, the following are to be noted: Curetting of sinuses; cauterizing of sinuses; injecting of sinuses and cavities; incising and aspirating of abscesses; removal of tumor alone; of axillary glands alone; of the tumor and a portion of the breast with the tumor; and finally and probably more successful, removal of the breast with the axillary glands.

Instrument to Protect the Brain during a Craniotomy with the Gigli Saw.—The following sensible device for protecting the brain during craniotomy with the Gigli saw is described by F. G. SCHÄFFER (Ann. of Surg., April, 1903). In order to control hemorrhage in the scalp, he passes a rubber tube twice around the head and secures it against slipping by a few stitches of silk carried through the scalp and tied at three or four points. After the four holes which mark the sides of his trap-door are drilled through the skull, a watch-spring and a brain protector of the same material, connected, are passed between the skull and the dura mater. The watch-spring and protector are now disconnected and the saw is attached to the loop in the former, which is then withdrawn, carrying the saw with it through the holes, leaving the protector behind. The saw-cut is now made so that the flat watch-spring protector lies between the dura mater and the skull.

Shock Produced by General Anesthesia.—In studying shock from anesthesia it is not only essential to consider the specific toxin of the anesthetic used, but the resulting toxic bodies generated through the immediate or more remote influence of general anesthesia. F. B. TURCK (Jour. Am. Med. Assoc., May 2, 1903) has recently made some experiments with ether and chloroform on dogs and deals with the anesthetic as a cellular poison, with the disturbances of function as a result of the anesthesia, and with the toxins that are evolved either from the direct effects of the anesthetic or from the disturbances of certain functions of the body. He finds that shock is a very complex phenomenon. The circulatory disturbance is a direct result of the chloroform or ether acting on the vasomotor centers. Their prolonged action on the splanchnic circulation results in congestion associated with fall in temperature. The toxins of ether and chloroform acting on cells, may produce toxic products, and from these, symptoms of auto-intoxication, associated with the formation of hemolytic and agglutinating bodies and precipitins. The disturbances of elimination result from retention of toxic products. The blood serum becomes less resistant to bacterial toxins and also to the development of saprophytic and pathogenic microorganisms. This is partly explained by the changes observed in the sera, such as diminished antiferment properties, etc. Reflex irritation of the alimentary tract may result from the excretion of the anesthetic into stomach and intestines, or atony may increase the formation of toxins in the stomach, and the accumulation of gases interfere with the circulation. There is increased toxicity of the stomach contents in the presence of chloroform and ether.

Non-Medicinal Treatment of Constipation.—The advisability of relying upon non-medicinal methods of treating chronic constipation is realized by all, but it is frequently impossible to secure satisfactory results without at least temporary reliance upon some drugs. S. G. GANT (N. Y. Med. Jour., April 18, 1903) has not resorted to drugs in the treatment of these cases in many years and he details the methods which he employs. Massage is one of the most essential features in the treatment of chronic constipation. In addition to kneading the colon, special massage should be given to the small intestine, liver and rectum. It improves the circulation, stimulates nerve centers and restores tone to inactive muscles. It loosens adhesions, excites the liver and intestinal glands to secretion and assists peristalsis. Electricity in the form of faradism has proven to be a valuable adjunct. The positive pole may be applied over the spine or within the rectum and the negative pole is moved about over the small intestines, colon and liver. Enemata of soap-suds are sometimes necessary early in the treatment of constipation, to secure evacuations until the bowel is able to relieve itself, but the continued daily use of injections is to be deprecated. In addition the patient must observe the following rules: (1) Go to stool at the same hour daily; (2) meals should be taken at regular intervals, and plenty of time should be taken to masticate the food; (3) eat sufficient fruit and drink an abundance of water, especially before breakfast; (4) take a cold bath every morning, to be followed by brisk rubbing; (5) take regular outdoor exercise; (6) change from sedentary to active occupation if necessary. Divulsion of the sphincter should be done at the earliest opportunity when constipation is induced by hypertrophy or spasm of the muscle. Partial or complete division may be practised when the muscle is very

thick or when divulsion is inefficient. Valvotomy should be performed when one or more of Houston's valves have become hypertrophied and offer obstruction to the descent of the feces. The rectal valves can be satisfactorily divided without pain, danger or confining the patient to his room by the use of the Gant valve-clamp, which can be applied in the office and which cuts its way out by pressure necrosis and comes away with the feces in four to six days, leaving the severed edges of the valves widely separated. Valvotomy has given very good results in many cases, but frequently necessitates the use of the above procedures as well.

X-Ray Treatment of Pseudoleucemia.—The treatment of this disease has previously been very unsatisfactory and in spite of early operation death has been the invariable outcome after a comparatively short duration. N. Senn (N. Y. Med. Jour., April 18, 1903) reports two cases of this disease, in both of which the glands had reached a considerable size and were gradually advancing. In the first case 34 treatments were given by the X-ray, an intermission being found necessary after the tenth exposure on account of the development of a dermatitis. In the second case after 15 treatments a slight dermatitis appeared, and at the same time symptoms pointed to a slight toxemia. There was a loss of appetite and an increase in the anemia. After a suspension of treatment for three weeks, during which time he rapidly regained flesh and strength, he submitted to 12 more treatments with a further diminution in the size of the glands. In fact both cases have now so far recovered that the glands are barely palpable and the general health is markedly improved. Undoubtedly the constitutional disturbances which followed the prolonged use of the X-ray, and which set in simultaneously with the progressive diminution in the size of the glands were due to a toxemia caused by the absorption of the products of degeneration. This was also probably the cause of the increased size of the spleen which was noted in the second case. The X-ray has thus proven itself capable of curing another previously considered hopeless disease, and when experience has taught us how burns may be prevented and toxic symptoms avoided without reducing the curative effect, we shall possess a most valuable remedy.

The Surgical Treatment of Pruritus Vulvæ.—The treatment of idiopathic cases of this condition is among the unsolved problems of gynecology. Among the surgical procedures suggested for the relief of this condition is the resection of the nerves which supply the vulva. This has usually been limited to the pudic nerve, and the disadvantages are that the sphincter ani is deprived of its innervation and incontinence of gas and feces result. B. C. HIRST (Am. Med., May 16, 1903) claims that the only method certain to accomplish the desired result is to cut off all the sensory nerve supply to the part, and this is made up of the inferior pudendal, the ilio-inguinal, and the genital branch of the genitocrural nerves. The incisions are four in number: two in the groins as for an Alexander operation, and two in the buttocks parallel with the ascending ramus of the ischium, beginning just above the tuberosity and extending upward about two inches. By the groin the genital branch of the genitocrural and the ilio-inguinal nerves can be readily exposed by careful dissection, although it may be necessary to open the inguinal canal by incising the deep fascia. After the nerves are isolated they are divided and as long a distal piece as possible is freed and extracted. The inferior pudendal nerve is readily isolated where it crosses the ramus of the ischium, about an inch above the tuberosity. The perineal branches of the pudic are not so easy to discover, but a careful dissection should display them in the upper outer portion of the ischio-rectal fossa. If the clitoris is involved, its dorsal nerve must be resected. The author reports two cases in which this method met with great success. It still remains to be seen, however, whether this procedure may not in time be followed by some atrophic changes and the development of a kraurosis vulvæ.

Ethyl Chloride as a General Anesthetic.—In a study of ethyl chloride for use in general anesthesia, W. J. MCCARDIE (Lancet, April 4, 1903) offers the following conclusions: He says that he has not tried ethyl chloride for the largest operations because he sees no advantages in it over ether or chloroform, for one is working within narrow limits because of the tendency to quick return of consciousness. He does not think that very quick recovery (in one or two minutes) after major operations is of advantage to the patient, who would too often awake to consciousness of acute pain, mental distress and shock, apart from the fact that his immediate surroundings and removal to bed would be, to say the least, very unpleasant. However, hernial, renal and other operations have been done under ethyl chloride administered well over an hour in the longest cases. It is well recognized that all narcotic drugs haye limitations, and ethyl chloride certainly has them. He thinks, with many foreign observers, that ethyl chloride is well suited for many short operations, lasting up to fifteen or twenty minutes. Especially for short throat operations by skilled and quick operators, and for certain dental cases, ethyl chloride is of great advantage. As compared with ethyl bromide, which is much used abroad instead of "gas," ethyl chloride is safer because, as Binz says, the bromine compounds have a much more lasting and toxic effect on the tissues than the chlorine compounds. According to Overton, narcosis with chlorine compounds may be kept up much longer than is the case with bromine derivatives. This probably depends on the fact that watery solutions of bromine compounds gradually split up and give off free bromine. Certainly, the death rate is much less in ethyl chloride than in ethyl bromide. Again, ethyl bromide leaves behind it a garlicky smell and taste which persists in the patient's breath for one or two days after. The drug, too, is very liable to become impure on keeping. In concluding, he says with regard to the first and all-important question of safety, that he has given ethyl chloride 450 times, and he has never had any trouble during narcosis ascribable to the drug itself. He gives it now with confidence, and out of a total of more than 1,000 cases, last year, of administrations in general, as apart from dental surgery, he has administered it about 350 times. He judges that any serious effects would be seen first in the respiratory apparatus and secondarily in the heart. The general action on the circulation and respiration appears to be stimulative.

A Case of Iodoform Poisoning.—In describing a case of iodoform poisoning, ALAN H. MUIR (Lancet, April 4, 1903) gave the following facts: He said that the patient, a man aged thirty-five years, was admitted to the hospital on March 5, 1903, with a large non-tuberculous abscess on the calf and the thigh of the left leg. The temperature was 102° F., the pulse 100, and the general condition fair. On March 6 the temperature ranged from 98 to 99° F. Next morning he opened the abscess, irrigated the cavity and put in a connecting drainage tube. While the assistant was putting in iodoform, quite half an ounce or more dropped accidentally into the large cavity. For twenty-four hours the temperature remained normal. At 8 P.M. March 8, the patient had a rigor, when the temperature rose to 102° F., and two hours afterward it was 104° F., the pulse being 140 and weak and thready, and the respirations

being 24 and normal in character. The patient became restless and delirious, but remained conscious and vomited three or four times. Nothing noteworthy regarding the pupils, the urine, etc., was observed. Quinine and whisky were now administered, and at midnight, when the temperature was 103° F., the cavity was washed and swabbed out, the iodoform forming quite a coat. In twelve hours the temperature, which came down gradually, was normal, the pulse was 120 and fair, and the patient was quiet and sensible. This condition was maintained, the temperature remained normal, the pulse being 80 and good, and the respirations being 24.

Carbolic Acid Poisoning by External Application.—In a study of a case of carbolic acid poisoning, due to external application, J. A. RAUBERHEIMER (Lancet, April 18, 1903) gave the following history of a child, aged six years, who was admitted to the hospital on March 4, 1903. She was suffering from genu valgum on both sides. Her general health was good, except that she had adenoids. On March 20 at 11 o'clock in the forenoon she was prepared for operation by a nurse. The process of preparation was as follows: (1) The parts were well scrubbed with warm water and soap; (2) all traces of soap and grease were removed by a thorough cleansing with methylated ether; and (3) the legs were wrapped up from the ankles to the groins in towels impregnated with carbolic acid, 1 to 40 (no acid had ever been applied to the patient before). Being nervous, the child cried vigorously while these preparations were taking place. At 12 o'clock she became quiet and drowsy. At 12.55 P.M., while being conveyed to the hospital for operation, she was still quiet, listless and drowsy. The condition was thought at the time to be due either to exhaustion from crying or possibly to the presence of the adenoids. At 1.05 P.M. the administration of chloroform was commenced. On examining the patient, she was apparently fast asleep, could not be made to speak, and took no notice of smart blows on the hand, and was quite unconscious. The pupils were dilated, the pulse was feeble and rapid and respiration was quiet. She was taken back to bed at once and immediately afterward was cyanosed and practically pulseless. On consultation, it was decided that the case was one of carbolic acid poisoning, due to external application. The carbolized towels were quickly removed and the parts were found to be very pale. A dram of whisky by the mouth every half hour until consciousness had been regained, drinks of hot tea frequently, a subcutaneous injection of five minims of ether, hot bottles to the extremities, and a mustard plaster on the precordia—were administered without delay. Some urine was drawn off, but no carboluria was present. At 3.30 P.M. the patient began to recover and to regain control over the bladder and rectum, which, before this, had been moved involuntarily. About 4 P.M. vomiting commenced, but nothing peculiar could be detected in the vomit. The patient now began to improve rapidly. At 5 P.M. another specimen of urine was obtained, which was found to be of a pale green color, gradually becoming darker on exposure to air and light. On chemical examination it responded to the usual tests for carboluria. All subsequent samples during the next twenty-four hours gave the same results, thus verifying the diagnosis. The patient recovered completely.

The Etiology of Carcinoma of the Esophagus.—An interesting contribution to this subject is made by P. WOLF (Münch. med. Woch., May 5, 1903), who reports two cases of carcinoma of the esophagus associated with a severe grade of spondylitis deformans. He discusses this condition as a possible etiological factor and assumes three explanations. It cannot, of course, be denied that the association may be entirely accidental. The probability that there is any etiological connection between these two conditions depends altogether on their continued association, and the author believes that in his own cases the anatomical deformity caused by the spondylitis served as a constant irritation during the act of swallowing. Such a continual irritation might here, as in other localities, serve as a predisposing cause to the formation of a cancerous growth. The third possibility, that the cancer was the primary, the spondylitis the secondary lesion, was not considered probable in the author's cases, as the spine exhibited lesions entirely remote from the site of the cancer, and these antedated the symptoms of the malignant growth. The chronic source of irritation affords a very plausible cause for the production of a malignant tumor in these instances.

Tetanus.—A study of 57 cases of this disease, which occurred in the Pennsylvania Hospital, Philadelphia, from 1874 to 1903, is published by G. W. NORRIS (Phil. Med. Jour., May 16, 1903). No cases were noted between the years 1886 and 1893—for which no explanation appears. The mortality was 84.2 per cent., death, contrary to the usual statement, occurring with almost equal frequency up to the eleventh day. The average specific gravity of the urine was 1.026, and it was usually high in the fatal cases. It is possible that this is due to the fact that on account of the fixation of the jaws, and the dysphagia, but small quantities of liquids can be imbibed. But this should call attention to the flushing of the system with water, which is a factor of treatment that has perhaps received too little attention. Death occurred in convulsions in 11 cases, in 12 cases from asthenia without convulsions. Seven patients were treated by the Bacelli method (carbolic acid given hypodermically to the limit of tolerance), with a mortality of 85 per cent. Tetanus antitoxin was only used in three cases with two deaths. The author has employed the symptomatic treatment in the larger number of cases, but does not recommend any definite drug, relying largely on the importance of local treatment and on prophylactic injections of antitoxin in suspected cases.

Suture of the Great Sciatic Nerve.—A case of this rare condition is reported by J. H. DUNN (Jour. Am. Med. Ass'n, May 16, 1903), as occurring in a youth who was struck by a scythe. The implement severed the muscles on the back of the thigh, and cut the sciatic nerve near the gluteal fold. Two days later operation was undertaken. The wound had become badly infected. The divided ends of the nerve were exposed, stretched and approximated with catgut sutures. The sheath was also sutured. The wound healed fairly well and about six weeks later improvement in sensation was noticed. A rubber muscle was then stretched from the toe of his shoe to a band below the knee, which he wore for eight months, at which time the improvement, both motor and sensory, was sufficient for him to resume work without wearing any artificial appliance. Four years later there was perfect restoration of function, except a decided paresis of the anterior tibial group of muscles. Sensation was slightly diminished along the outer side of the leg and foot. The only trophic disturbance was indicated by a small characteristic perforating ulcer of the heel, which had not improved for lack of proper care.

Amputation under Cocaine Anesthesia.—Another contribution to this subject is made by J. H. GIBBON (Phil. Med. Jour., May 2, 1903), who reports a case of painless amputation of the leg in a man of fifty years, who was suffering from far-advanced tuberculous disease of the ankle-joint and foot. The age and general condition precluded general anesthesia. Mor-

phine, gr. ¼, and atropine, gr. 1/100, were given hypodermically fifteen minutes before the operation. The sciatic and anterior crural nerves were then exposed by the infiltration method of Schleich and injected with a one-per-cent. solution of cocaine. The operation was done without any pain or shock, at the middle third of the leg. The author calls particular attention to the infiltration for exposure of the nerves and insists that the solution be pure and fresh and the technic perfect.

GENITO-URINARY AND SKIN DISEASES.

A Case of Systemic Blastomycosis.—The following résumé of a case of systemic blastomycosis, with multiple cutaneous and subcutaneous lesions, is given by O. S. ORMSBY and H. M. MILLER (Jour. of Cutan. Dis., March, 1903): (1) The first evidence of the illness which ended fatally in this case was in the lungs; (2) early general toxemia was present, as evidenced by fever, weakness, emaciation, etc.; (3) the cutaneous manifestations began two months after the initial illness, and were manifestly of internal origin, coming by way of the circulation; (4) these lesions comprised subcutaneous and cutaneous nodules and abscesses, open and discharging or crust-covered ulcers, and were extensively distributed, being as a rule smaller about the face and head and larger on the extremities. The trunk had comparatively few; (5) pure cultures of blastomycetes were obtained from the subcutaneous abscesses before death, and from various tissues and internal organs post mortem; (6) microscopical examination of both the internal and external lesions and the sputum failed to show any tubercle bacilli, but all showed enormous numbers of blastomycetes; (7) animal experiments were negative as to tuberculosis; (8) tuberculin reaction was negative; (9) post-mortem examination revealed: lungs riddled with miliary abscesses and tubercle-like lesions, the pleura studded with nodules, the liver extensively filled with miliary abscesses and tubercle-like nodules, the kidneys similarly affected but not so extensively, the spleen markedly involved, some portions being practically destroyed, the mesentery studded with the nodules. In all these situations blastomycetes were demonstrated microscopically and culturally, but tubercle bacilli were found in none; (10) the early lung involvement and other symptoms, the laryngitis, the microscopical appearance of the organs, and the patient's family history, all suggested tuberculosis; (11) the absence of the tubercle bacillus, culturally, microscopically, and experimentally, the negative tuberculin-reaction, the absence of the usual microscopic tuberculous architecture, the failure to reproduce tuberculosis in animals, the extraordinary number and rapid evolutions of the cutaneous lesions, and, lastly, the abundance of the blastomycetes in every lesion, ruled out tuberculosis.

Etiology of Acne Vulgaris.—The following results have been obtained in investigations into the cause of common acne by T. C. GILCHRIST (Jour. of Cutan. Dis., March, 1903). Definite bacilli, named by him *Bacillus acnes*, were present in all smears from 240 tuberculous acne lesions, in 86 different patients. Pure cultures of this bacillus were obtained from 62 lesions (chiefly nodules), from 29 patients; 82 cultures were sterile, among which 70 were sterile because the proper media were not used. The remainder showed a growth of the *Bacillus acnes* mixed with the *Staphylococcus pyogenes* or *S. epidermis albus*, or the latter organism was in pure cultures. Sections of an excised comedo, of an early acne papule, or an acne pistule, and of five acne nodules, from six patients, demonstrated the stages of the disease. Sections of the nodules showed changes extending deep into the chorium surrounding in some instances a hypertrophied follicle. The lesion was made up of masses of cells, and plasma cells were numerous in some nodules, but not in others, in which their place was taken by lymphoid cells or by connective tissue cells. Many polymorphonuclear cells were also present, and were massed in some sections so as to form miliary abscesses. Phagocytes and pigment-cells were sometimes very numerous. Blood cells were numerous and dilated. In one section a large group of *Bacillus acnes* was situated deep in the chorium, beneath the follicle, but in most of the sections only a few small clumps or scattered bacilli were found. The *Bacillus acnes* is pathogenic in mice and in guinea-pigs. It is present as a short, thick bacillus in smears, but becomes thicker and longer in cultures. Among early cultures, it assumes a branching form. It grows when planted in masses on acid glycerine agar and forms a pultaceous, easily movable mass. By the clumping of this bacillus in the sera of patients affected with disease, it is to be inferred that the specific toxic body derived from the presence of the bacillus in the tissues is absorbed by the blood, resulting in the production of a specific glutenin.

Inquiry into the Value of the Irrigation Method.—The testimony offered both for and against the irrigation treatment of specific urethritis has been analyzed by ORVILLE HORWITZ (Proc. Phil. Co. Med. Soc., Feb. 28, 1903), from which he derives the following conclusions: (1) The irrigation method of treatment will not abort acute specific urethritis; (2) it will hasten the terminal stage which is difficult to cure; (3) chronic urethritis and involvement of the deep sexual organs are common consequences; (4) in many instances in order to effect a cure in the terminal stage of the disease, the irrigations must be discontinued and other methods of treatment employed; (5) irrigation should not be employed in the acute stage of specific urethritis; (6) irrigation of the deep urethra by means of hydrostatic pressure is injurious in the majority of cases of acute gonorrhea and is conducive to the development of complications; (7) little or no progress has been made in the treatment of acute urethritis either in aborting the disease, lessening its duration or preventing complications.

HISTOLOGY, PATHOLOGY, AND BACTERIOLOGY.

The Shiga Bacillus and Secondary Infections in Yellow Fever.—In a case of yellow fever in which coffee-ground vomiting occurred, J. GUITERAS (Rev. Med. Trop., April, 1903) obtained agglutination of the Shiga bacillus in twenty minutes, with dilutions of 1 to 50. The patient died on the fourteenth day of the disease, and continued to the end giving the Shiga reaction and showing hemorrhagic symptoms; hence the author thinks it possible that, the Shiga bacillus belonging to the hemorrhagic bacteria, secondary infection with this organism may be responsible for some of the symptoms of the disease, such as hemorrhage and remission of fever.

New Method for Imbedding Tissues.—A simple method for hardening and imbedding tissues for microscopical examination, is published by B. M. BOLTON and D. L. HARRIS (Am. Med., May 28, 1903), which effects a great saving of time. The fresh tissues are placed in a hot two-per-cent. solution of agar-agar to which 10 per cent. of formalin has been added. The temperature of this fluid should be kept at about 70° C. After remaining in the solution for from one to several hours, the tissues are attached to blocks with a five-per-cent. solution of agar-agar containing 10 per cent. of formalin. The heat and the formalin harden and fix the tissues at the same time that the agar-agar impregnates them. The blocks are then placed in 95 per cent. alcohol

for two to four hours and are ready for sectioning. The advantage over the celloidin method being that the aqueous solution of agar-agar at once penetrates the tissues, making preliminary dehydration unnecessary.

Agglutination of the Blood Plates in Febrile Diseases.—Attention was first called to a phenomenon occurring in blood specimens prior to coagulation, by Ducceschi; this consisting in the appearance in a healthy blood-specimen of minute whitish granules; which, upon microscopical examination, proved to be agglutinated blood plates. A. ZERI and M. ALMAGIÀ (Policlin., April 4, 1903) have examined with special reference to this phenomenon, the blood of patients affected with pneumonia, pleurisy, typhoid, scarlet fever, measles, malaria and other diseases. Agglutination of the blood plates was seen in all save tertian and quartian malarial fever. Non-agglutination was observed in the afebrile as well as the febrile periods; and after the use of quinine in sufficient quantities to overcome the febrile seizures, agglutination reappeared. The authors believe that if further observations prove non-agglutination of the blood plates to be a constant characteristic of malarial affections, the phenomenon may be utilized in the rapid diagnosis of malarial blood. Ducceschi's technic was followed in the work of the writers who describe it as follows: A few drops from the punctured finger tip are allowed to fall upon a glass slide, the latter being tipped from side to side a time or two. Soon after, whitish granules may be seen in the specimen when it is held to the light. This is then fixed and stained with a one-per-cent. solution of methylene blue, and examined under the microscope, when the granules are seen to be made up of agglutinated blood plates.

Autohemolysis from Alcohol.—The case of an alcoholic patient in whom hemoglobinuria appeared repeatedly, upon the abrupt cessation of alcoholic indulgence and disappeared when its use was resumed, furnished the incentive for experimental work by S. MIRCOLI and A. GERVINO (Gazz. Osped., April 12, 1903) undertaken with the view of inducing a repetition of the phenomenon in animals, and determining whether alcohol induced hemoglobinemia or at least a modification of hemolytic power. To this end rabbits were given large daily doses of alcohol for a period of three months; and at the end of that time the blood-serum was found to be of a decided red color; this condition of hemoglobinemia being considered by the authors as proof positive of hemolysis. It was further noted that such blood specimens were slow to coagulate and in two instances, in which hemoglobinemia was most marked, the blood failed to coagulate, even after three days. Hemoglobinuria was, however, not produced in the animals experimented upon; but marked urobilinuria appeared. This the authors account for upon the ground that the animals' kidneys had not yet lost the power to convert a large part of the blood-pigment into urobilin; while the patient's kidneys, injured by long years of abuse, failed in their power of transformation when the stimulus of the alcohol was withdrawn. Noteworthy is the fact that the rabbits' serum regained its normal limpidity within a month after the suspension of alcohol, and the coagulability of the blood returned. The authors liken the condition of the blood in these animals to that of immune blood; such phenomena coinciding, in their belief, with the quality of the serum and blood of tuberculous patients in good condition, who succeed in establishing a species of auto-immunization followed by spontaneous healing. In previous work, Gervino demonstrated a special resistance to tuberculous infection in animals fed with alcohol, and these experiments are believed by the authors to clear up the question of administration of alcohol in tuberculosis and place its use upon a scientific basis.

Probable Nature and Life-Cycle of the Yellow Fever Germ.—In the fact that the yellow fever germ requires two hosts for the completion of its life-cycle, *i.e.*, the body of a non-immune human being and a special variety of mosquito, CARLOS FINLAY (Rev. de Med. Tróp., April, 1903) finds an analogy to the malarial germ which suggests that the former, like the latter, is a protozoon and not a bacterium, and goes through phases of development similar to those of the malarial parasite. His study of the subject leads him to believe that the *Stegomyia fasciata* is the permanent host of the yellow fever parasite, while the human blood is the permanent host for the plasmodium. He states that it is positively known that the germ of yellow fever continues to live within the body of the *Stegomyia* at least two months; and it is probable that it there lives during the remainder of the infected mosquito's life. In closing this highly interesting paper, the author draws the following conclusions: (1) The yellow fever germ, being the parasite of a small insect, must be a much smaller protozoon than the malaria germ, which is a parasite of man. (2) The reality of invisible (ultra microscopical) germs as promoters of human infectious diseases having now been scientifically demonstrated (Annals de l'Institut Pasteur, Feb., 28, and March, 1903) it is possible that the germ of yellow fever may be one of that class. (3) For other infectious diseases, the germs of which have escaped detection, such as the eruptive fevers and syphilis, it may be surmised that these germs are, or at one time were, parasites of a very diminutive insect-host which either continues unsuspected or may have become extinct. (4) The sojurn of the yellow fever germ in the human body is of short duration, in accordance with its object, which is mainly to secure the preservation of the species by sexual reproduction. (5) The function of sexual reproduction of the germ in the human host is accompanied by the elaboration of powerful toxines to which must be directly attributed the attack of yellow fever. (6) Apart from the elimination or destruction of the *Stegomyia* and *Anopheles* mosquitoes, the main reliance for the prophylaxis of yellow fever and malaria should consist in preventing the transfer of the parasite from the intermediate to the permanent host, since by that means the extinction of the germ may be obtained; but while this is comparatively easy in the case of yellow fever, its accomplishment for malaria presents almost unsurmountable obstacles. There is no great difficulty in preventing a yellow fever patient (intermediate host) from being bitten by and infecting the healthy *Stegomyia* (permanent host), but, in a malarial locality, it is almost impossible to prevent the contaminated *Anopheles* (intermediate host) from biting and infecting some of the healthy persons (permanent host) in the locality. Serious efforts to prevent the transfer from the permanent host to the intermediate one, should of course never be omitted, but their efficacy as a means of stamping out the disease is infinitely less than the former instance. The reason of the difficulty in this case arises from the chronic if not life-long presence of the germ in the body of the permanent host so that control of the latter becomes practically impossible except by a general extermination or prolonged reclusion of such hosts. (7) If the existence of pathogenic bacteria requiring two hosts should be admissible in human pathology, leprosy and tuberculosis would be typical instances of the sojourn of the bacterial parasite in the body of its permanent host and in which the possibility of an intermediary host has hitherto been completely ignored or overlooked.

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SMITH ELY JELLIFFE, A.M., M.D., Ph.D., Editor,
No. 111 FIFTH AVENUE, NEW YORK.

Subscription Price, including postage in U. S. and Canada.

PER ANNUM IN ADVANCE	$4.00
SINGLE COPIES	.10
WITH THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, PER ANNUM . .	8.00

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LEA BROTHERS & CO.,
No. 111 FIFTH AVENUE (corner of 18th St.), NEW YORK.

SATURDAY, JUNE 13, 1903.

THE RISING IMPORTANCE OF PHYSICS IN MEDICINE.

NO SCIENCE is of more use in every-day life to the average man than physics is, for it serves him continually in all his years, whatever his occupation, as a rule by which he can best adapt material objects and physical forces to the purposes of his will. To know physics well and to be in the habit of practically applying it in the management of our bodies is to excel and to do so by being in a literal sense unconnected with stoical philosophy in harmony with Nature. For all men, surely, physics whether technical or in the form of the hereditary common wisdom of the race, is one of the most useful and hence one of the most valuable of the departments of present knowledge.

To medicine, the science of physics is rapidly becoming, with chemistry, the most indispensable of propedeutics. Chemistry has long been recognized as lying at the base of medicine but its sister science Physics is now taking its rightful place there, too. The pressing need is that it be given opportunity to still further explain vital functions at present obscure to the average medical student. This science is obviously at the basis of physiology, for physiological chemistry, once so large a part of physiology, now takes care of whatever organic processes are atomic. Physiology then when this separation has gone its limit will be practically biological physics. It will concern itself with molar movements and those described as molecular as distinguished from those which are atomic or chemic.

One needs only to look up and down the devious ways of a complex animal body such as man's to immediately appreciate that the more an intending student of medicine knows of physics the more easy and complete will be his understanding of vital processes and of their multiform derangements. The structure of the skeleton and the movements of its parts on one another are understandable only on the principles which physics explains. Exemplified in various complication in the joints are the three sorts of levers so familiar in mechanics. Without a complete knowledge of these complex leverages of bone and muscle such operations, *e.g.*, as those which Dr. Lorenz has recently demonstrated to us would be dangerous or even impossible, and orthopedics in general an uncertain and so relatively useless branch of medicine. Every surgeon, too, must understand the mechanical relations of the parts of muscles and of the muscles to the bones and viscera they serve. Obstetrical procedures of many sorts depend entirely on mechanical principles or on other departments of physics. The circulation of the blood exhibits numerous complex conditions of hydraulics especially, such as those of the structure and action of pumps, the more or less complicated principles concerned with flexible and elastic tubes, capillarity, elasticity of solids and fluids, friction, the pressure of liquids, the relative specific gravities of solids and the liquids in which they float, suction, siphonage, perhaps, and filtration and osmosis through membranes. The blood and the lymph and the functions of the lymphatic system involve besides these hydraulic relations, matters of color vision of spectroscopy and especially of the osmosis and diffusion of liquids which are of such almost universal occurrence in bodies made up of saline solutions separated by living animal membranes.

A due appreciation of the wonderful means by which the tissue-cells are aerated, respiration, requires thorough knowledge of pneumatics, including the diffusion of gases, Boyle's laws, partial pressures, vacuums, solution in liquids, and of elasticity of solids, levers, atmospheric pressure, osmosis, besides those concerned only with the circulation. The immensely complex events

of digestion, absorption and assimilation included under the general term nutrition are really comprehensible in any degree adequate to medicine only with a real knowledge of several branches of physics, mechanics, hydraulics, and especially osmosis. The whole process of secretion with its innumerable varieties and modes, requires for its comprehension knowledge of the theory and practice of hydraulics, osmosis and diffusion and filtration. For the intimate understanding of the structure of muscle- and nerve-cells and of their action as developed by Mathews, one needs to know how salines and extractives, electrolytes, act on animal membranes and on each other by their ions. Electricity especially rapidly becomes a most indispensable object of knowledge to the professional man; its relations to medicine are continually more various. The modern laboratory course in physiology, an important portion now of every good medical curriculum, involves no little knowledge both theoretical and practical of galvanism, induced electricity, magnetism and of the electrical apparatus employed in the complicated experiments of class physiology. These instruments are often of no little complication; for example, the capillary electrometer, the inductorium batteries, the rheochord, and require for their intelligent use a far larger amount of the theory and practice of electricity than was ever demanded before of first-year students. This alone makes the need of more "entrance physics" imperative. Later on in the course and in practice afterward a technical knowledge of electricity and of electrical apparatus is indispensable for the proper and safe management of lamps, cauteries, centrifuges, Holtz machines, X-ray apparatus, etc. In the dental colleges still more electricity is required for various technical uses.

The development of the use of the Roentgen rays in diagnosis and in surgery, dermatology, etc., makes scientific information concerning them requisite for the physician who would be more than a mechanic, while the recent efforts to introduce the Becquerel (?) rays and the Finsen light make these new topics for physical study and information. In medicine as in every other department you experience, electricity is rapidly becoming in multiform aspects indispensable. No one can understand the ear and the process of hearing without a good knowledge of acoustics and much physics besides. To him who would know somewhat of the eye and of vision in form and in color with its multivarious complexities, optics and the theories of color and of space are entirely necessary. One sees in topics like the regulation of body temperature and the relations of weather to rheumatism large fields for the exploitation of any amount of physics. These all are but examples which show the complexity of an adequate physics of a living body,—but even these, selected out of the multitude, show this condition well. The highly evolved animal body is a living machine of a complexity and intricacy of structure and interworking as yet scarcely imagined; to explain it completely at last is largely the task of biological physics.

It is our present contention, then, that the amount of physics possessed by the average candidate in medicine is quite inadequate and that the requirements of this science for admission could be largely increased with great benefit to the usefulness of anatomy, physiology, surgery, obstetrics, pathology, orthopedics, otology, ophthalmology and electrotherapeutics at least. The time will come before long, with the inevitable lengthening of the medical course to six or seven years, when the relative importance of physics and of chemistry over, *e.g.*, Latin, will be realized by medical educators. Preparation must be kept in adjustment with the course for which it prepares, but at present the need of physics has far outrun the requirement in the subject in any medical college of the land.

THE SUBCLAVIAN TRIANGLE.

IT seems as though the details of regional anatomy, for surgical and medical purposes, should be fully known after all these years of investigation. Every now and then, however, a distinct contribution to our practical knowledge of some part of the body as regards its surgical relations shows that there are still many fruitful fields for observation, even in this supposedly worn-out subject. Prof. Waldeyer, the director of the First Anatomical Institute of Berlin, and one of the most skilful dissectors as well as perhaps the greatest of living anatomists, has been recently making observations at the base of the neck and is of the opinion that in spite of all the patient investigation of this region there are still some important elements of relational anatomy not definitely settled. His monograph on the Subclavian Triangle (Das Trigonum Subclaviæ, Waldeyer, Bonn, 1903) is dedicated, on the occasion of the twenty-fifth year of his professorship, to the professor of anatomy at the University of Pavia, where Waldeyer made some of his anatomical studies.

This subclavian, or, as it is sometimes called, vertebral triangle, whose base is the clavicle, or in its deeper layers the first rib, has for its apex the prominence of the sixth cervical vertebra, which can easily be seen and felt, and is such an important landmark in the neck. Because of the fact that the carotid can be compressed against it, it is sometimes spoken of as the carotid tubercle or the tubercle of Chassaignac, from the French anatomist and surgeon who first suggested its availability for this purpose. The triangle has for its sides the anterior scalenus muscle in front and the longus colli behind. It is easy to understand how many important structures occur in the spaces thus outlined. The most important feature of its relational anatomy is the fact that the apex of the lungs in full inspiration rises into its middle portion. When thus inflated, the lungs are more patent to investigation than in any other part of the body.

It is in this triangle anteriorly and posteriorly that the most careful physical diagnosis has to be made in suspected pulmonary tuberculosis. It is in this region, by a special peculiarity of the disease, that tuberculous lesions most frequently occur and investigation at or below the level of the clavicle may fail entirely to reveal what are serious though sharply localized apical conditions. Waldeyer calls special attention to the fact that this rise of the lungs high up into the subclavian triangle displaces many important structures, thus making the surgical relations of the space variable, with successive phases of the respiratory acts. The blood-vessels especially are displaced, and the veins here may easily be injured in operative procedure because of their constant change of location. On the left especially the so-called venous angle, at which the thoracic duct empties into the subclavian vein, may be displaced during deep inspiration, such as is likely to occur if the action of the anesthetic should be interrupted for a time and then resumed. As the thoracic duct not infrequently, as Waldeyer emphasizes, divides into several branches just before emptying into the vein the danger of wounding some part of the structure is increased.

In deep inspiration the apices of the lungs in the floor of this triangle are pressed closely against the skin, thus making them very approachable for diagnostic purposes. During expiration they retract noticeably, so that it is important for the diagnostician to make his judgment, so far as possible, on what is found at the height of inspiration. If this rule were always followed, there would be fewer complaints of the failure to find physical diagnostic signs in the lungs at a time when tubercle bacilli can be demonstrated in the sputum and the irregular pulse and temperature show the evident existence of tuberculous deposit. The subclavian triangle in its medical and surgical relations is thus seen to be one of the important regions of the body.

NEW YORK'S KINDERGARTEN OF CRIME.

IT is seldom that an enlightened commonwealth either deliberately, or through ignorance, trains a certain percentage of its citizens in the gentle art of crime, but such is the anomaly presented by the Empire State.

We do not for a moment believe that this is done intentionally, or wilfully, and have every reason to suppose that it is largely through ignorance of the conditions that the situation as now present in New York State is permitted to continue. Contributory to this there also exists a tendency which we have already had occasion to condemn among our politicians at Albany to deprive the lawful charges of the State of a just amount of care and support. This tendency has become manifest in the State control of the insane, where insufficient funds have been appropriated to carry on the necessary work in our large State hospitals.

It is, therefore, with deep regret not unmixed with indignation that we see in another department of the State charities like tendencies for political graft and similar inattention to the bare necessities for healthful physical and moral development.

The recent exposure by Jacob Riis of the frightful conditions that exist in the House of Refuge in Randall's Island, supplies us with the facts on which this indictment is based. Mr. Riis has found that there are 800 boys practically in one building at the House of Refuge. This is a State institution. The boys are sent there, as is well known, for small felonies and petty crimes, and are herded together as though they were all of the same moral type, practically no attention being paid to a proper moral classification. The result is that the few really vicious boys contaminate the many who are nothing more than wayward, and thus we have a veritable kindergarten in crime.

It has been known for many years that our State penal institutions, as at present administered, are, for the most part, very poor institutions for the reforming of criminals. The pris-

oners enter our institutions to be possessed of many more devils than they ever knew outside their walls.

The changes that have come about in the construction and management of our large institutions, being built on the cottage plan, with the consequent separation of the inmates into small family groups, is an indication of the commencement of common sense methods in the control of large classes of defectives, and similar classification should, we believe, be instituted in the handling of the boys that are sent to Randall's Island and, it may be, to the Elmira Reformatory.

The State pays large sums of money, New York City alone pays millions, to protect its citizens from the wayward, and vicious, and the criminal classes. The bill is enormous, and what do we get for it? Practically nothing, and yet we go on year after year maintaining institutions wherein crime shall be taught to the many that they may come out into the world to join the "powers that prey."

Another fault pointed out by Mr. Riis, and others who have investigated this institution, is that the inmates are not properly clothed. He very rightly remarks "If decent clothes are put on their backs, they are given a chance to respect themselves."

Thus one more glaring illustration of the present administration's incompetent and "economic" methods of taking care of the State's defectives is exposed to the public eye. We do not think that things have ever been much better in the past, but it is high time that there should be preparation for improvement in the future.

ECHOES AND NEWS.

NEW YORK.

Antitoxin Scandals.—The Health Office has unearthed, it believes, a scandal implicating a number of physicians in this city. It would appear from statements, as published in the daily press, that a number of physicians, particularly on the East side, are obtaining free antitoxin for use in diphtheria, and are charging the patients for antitoxin used.

New Hospital Site.—The Board of Estimate, at its meeting in the Mayor's office this week, held a long public hearing on the plan of the trustees of Bellevue and allied hospitals to acquire the block bounded by Twenty-eighth and Twenty-ninth streets, First avenue and the East river for a site for an extension of Bellevue. The assessed value of the land in the block is $846,000. A number of physicians spoke in favor of the plan, but the matter was finally referred to the Comptroller for further investigation.

Appointments at Columbia.—Drs. Clarence A. McWilliams, Forbes Hawkes, and W. B. Coley have been appointed Instructors in Surgery in the College of Physicians and Surgeons of Columbia University, New York. Dr. F. S. Meara has been appointed tutor in the department of Materia Medica and Therapeutics. Dr. Norman Ditman has been appointed assistant in the department of pathology. Dr. Philip Hanson Hiss has been made assistant professor in bacteriology. Dr. F. R. Bailey has succeeded Dr. Freeborn as Instructor in Histology, and Dr. A. N. Miller is appointed assistant in this department.

Columbia Prizes and Awards.—At the recent commencement the following medical prizes, awards and appointments were announced: Of the ten Harsen prizes the first, $500, went to Alfred Jerome Brown, A.B.; the second, $300, to Peter Irving, A.B.; the third, $200, to Isaac William Kingsbury, A.B. The other seven prizes of $25 each were awarded to James Pendleton Erskine, A.B., Herman Otto Mosenthal, A.B., Frederick Brown Humphreys, Ph.B., Royal Storrs Haynes, Ph.B., Hans Zinsser, A.B., Ward Slosson Gregory, Ph.B., and Jesse Godfrey M. Bullowa, A.B. The Harsen prizes for clinical reports—$150 to Alfred Jerome Brown, A.B.; $75 to Joseph Greif; $25 to Peter Irving, A.B. George W. Crile, M.D., got the Cartwright prize of $500.

Fellows—In anatomy, Edward Anthony Spitzka, M.D.; in pathology, Augustus B. Wadsworth, M.D.; in pathology and physiological chemistry, Edward Rudolph Posner, M.D. The Stevens triennial prize of $200—Divided between L. Pierce Clark, M.D., and Thomas P. Prout, M.D. The Alonzo Clark Scholarship, annual value $700, went to Charles Norris, M.D.

Pathologist at Craig Colony.—Dr. B. Onuf has been appointed resident pathologist at the Craig Colony for Epileptics at Sonyea, N. Y. Dr. Onuf is a graduate of Zurich, Switzerland. He acted for two years as assistant to Prof. Forel at the Insane Hospital Burghölzli at Zurich, afterward devoting eight months to the study of ophthalmology with Prof. Haab in Zurich. Later he located in Brooklyn, N. Y., where he began to devote himself to neurology. He was affiliated with Dr. Sachs' clinic in New York for a number of years, and later with the nervous clinic at Long Island College, where he gave clinical and didactic instruction to the students. He served as neurologist to St. Catherine's Hospital and consulting neurologist of the dispensary of the Jewish Hospital in Brooklyn. From 1896 to 1902 he was associate in pathology at the Pathological Institute of the New York State Hospitals. Among his scientific contributions may be mentioned a monograph written in conjunction with Dr. Joseph Collins, entitled "Experimental Researches on the Central Localization of the Sympathetic with a Critical Review of its Anatomy and Physiology." In selecting a pathologist for the Colony, the chief aim was to utilize the unusual opportunities given at the Colony for studying the causes of epilepsy. The work is to be not only pathological but also clinical, and it is from this combination that fruitful results are hoped.

PHILADELPHIA.

Children's Sanitarium Opened.—The Sanitarium Association of Philadelphia began its twenty-sixth season at Red Bank, N. J., on June 6, when 2,000 children were given a free boat ride and a day's outing at that place. The authorities of the Bureau of Health, in seeking to bring about a lowered summer mortality among the children of the city, considered a proposition to erect tents in Fairmount Park for the care of sick children, but the sanitarium was thought to be the most desirable. The Philadelphia Red Cross Society has offered to furnish

twenty-five nurses for work among sick children during the summer.

Campaign of the Reorganized Philadelphia Health Board.—According to the *Philadelphia Press* Dr. Abbott is preparing to make a rigorous investigation of the health conditions of Philadelphia, and purposes to conduct a thorough house-cleaning of the city from a sanitary point of view. The summer coming on, his first efforts are to be devoted to the reduction of infant mortality, although it is not known whether he purposes preparing a card catalogue of the children of Philadelphia, as is now being done in New York by Dr. Lederle. The matter of tuberculosis is to receive a thorough overhauling, and all cases are to be recorded throughout the city. Special investigations are in progress to determine the sources of contagion in milk, and unripe and decomposed vegetables will receive special attention. In this way he hopes to diminish the amount of typhoid fever, which he believes may be in part due to lack of precaution along these lines.

A Preparatory Course for Trained Nurses.—Largely through the efforts of Dr. S. Weir Mitchell a preparatory course for young women who intend becoming trained nurses has been organized at the Drexel Institute and will be inaugurated in September. The movement is the result of serious consideration by the recognized leaders of the nursing schools, who were advised in their work by Dr. Mitchell. The course will not be part of the nurses' hospital work. It is intended chiefly to familiarize the students with their prospective duties and make their first year at a hospital easier. The course will be divided into two terms, the first beginning in September, the second in February. In the earlier part lectures will be given upon anatomy and physiology. Then chemistry will be taught, applied chemistry and cooking. There will be lectures, too, upon drugs and domestic science and economics.

In the later term bacteriology, as much of it as it is necessary for a nurse to know, will be taught. After examinations the pupils will be awarded certificates. An interesting branch to be taught in the new school is that of reading. Correspondence, too, will be part of this latter branch. Physical culture is another thing to be taught.

The *Press*, in a commendatory editorial, has the following to say in regard to the new movement: "For much of the training given after entrance to a hospital these institutions are inadequately equipped. Hygiene, physiology, cooking, instruction in materia medica and in general branches of education are not easily taught or learned in the intervals of exhausting work in ward and sick room, where the practical side of nursing is acquired. Many nurses break down under this double strain. The work is often ill done. With every effort, it must be cramped, strained and hurried. The year which the Drexel offers will give the branches which can be learned outside of a hospital. For this work the Drexel is precisely fitted. Its chemical laboratory, its school of domestic science, its gymnasium and its work in general branches, physiology and hygiene give both the equipment and the instruction needed."

The Calcium, Phosphorus and Nitrogen Metabolism in Acromegaly.—Drs. D. L. Edsall and C. W. Miller presented a report upon this subject at the Philadelphia Pathological Society May 28. A study of two cases was made and in each instance there was found striking abnormalities in metabolism. One of the patients was given for a time a special diet, the calcium, phosphorus, and nitrogen intake was determined and a careful study made of the urinary secretion. This revealed a retention of all three elements but most marked in the case of nitrogen of which 20 per cent. was retained. The phosphorus and calcium retention amounted to twelve and nine per cent., respectively, of the intake. If there was simple overgrowth of the bones in this disease, one would naturally expect the calcium retention to be most marked. The findings simply emphasize the point that the disease is not confined to the bony structures of the organism. The overgrowth of the nervous system that accompanies the bone changes is in all probability abnormal in quality. In the cases studied it was also found that the relative amounts of calcium excreted by the kidney and bowel were greatly changed from those in normal persons. Instead of the amount secreted by the kidney being from one-eighth to one-tenth of that from the bowel, the former nearly equaled the latter. Experiment showed that this change in proportion was not dependent upon diet. It is a part of acromegaly when that disease is progressing and hence may be of some diagnostic or prognostic value. The experiments detailed point to the fact that in acromegaly there is a growth of abnormal bone instead of an abnormal growth of bone. The disease may be in the nature of a changed metabolism in general, the bone changes being merely a part of this general involvement.

Aneurism of Aorta Rupturing Into the Esophagus.—This interesting specimen was presented by Dr. M. H. Fussell. It was removed from an alcoholic patient who had died rather suddenly from severe hemorrhage after giving a history of occasional expectoration of blood. The bleeding was supposed to be due to dilated esophageal veins. Autopsy revealed a small aneurism of the aorta which had a slit-like opening from that vessel into a sort of false sac between the aorta and esophagus. The latter had eroded and finally broken down the wall of the esophagus, the opening into the latter structure being considerably larger than that in the aorta itself. The esophageal opening was partially occluded by a blood clot.

Evolution of Scirrhous Carcinoma from Cystic Degeneration of the Mammary Gland.—A specimen showing the above change was exhibited by Dr. A. G. Ellis. The gland had been removed from a woman aged sixty-three years. Chronic interstitial mastitis was present, though this was not a conspicuous feature of the specimen. Many of the lobules were the seat of cystic degeneration that had transformed them into a number of small cysts or, in certain instances, into a single large cavity lined by epithelial cells. Some parts of the specimen showed the presence of a typical scirrhus. The interesting feature of the section shown was that at several points in the wall of one of the large cavities the lining epithelium had broken through and was directly continuous with the adjacent masses of carcinoma cells. The specimen was considered to be confirmatory evidence of the view that cystic degeneration does undergo carcinomatous transformation. The opinions of a number of surgeons, both for and against this view, were cited. The writer is strongly inclined to class cystic degeneration among the so-called pre-cancerous manifestations.

CHICAGO.

Officers of the Physicians' Club.—The Physicians' Club of Chicago held its annual business meeting and election of officers at the Sherman House June 1. The membership has increased materially and

the finances are said to be satisfactory. The officers elected for the coming year are: Secretary, Dr. Henry F. Lewis; Directors for two years, Dr. Joseph Zeisler, Dr. A. M. Corwin, and Dr. A. R. Small. The other Directors are Drs. A. C. Cotton, J. Clarence Webster, and John M. Dodson.

Hospital Investigation Ends.—The investigation into the charges made by the nurses and internes of the Chicago Baptist Hospital several weeks ago came to an end yesterday, when the special committee named to look into the complaints submitted its report to the Hospital Directory. Mrs. Howes, head nurse, against whom the most emphatic protest was made, is found to be altogether blameless and her retention recommended. She announced, however, that she had already accepted a new position with an Eastern Hospital, and tendered her resignation. The report, which was adopted by the Board of Directors of the Hospital, says the nurses are not receiving the lectures which the members of the staff have agreed to give, and that the training school can be greatly improved by a reorganization in its government and teaching.

Hospital Commencement.—The Woman's Hospital of Chicago recently held the graduating exercises. Addresses were given by Mrs. McDowell, of the Chicago University Settlement, and Drs. Charles E. Paddock and Rachel Hickey Carr. Dr. Henry T. Byford presided.

Resignation of Dr. Neely.—Dr. John R. Neely has resigned his position as General Superintendent of the Dunning Institutions, and Dr. V. H. Podstata has been appointed in his place.

Christian Hospital Enjoined.—Charging the unauthorized use of his name as an inducement to attract the interest of physicians throughout the country, Dr. John B. Murphy has secured an injunction against the Christian Hospital, restraining the officers of the institution from representing him as a member of their staff, and from using a letter-head in which his picture appears. This was followed by the arrest by Federal officers of two of the promoters of the hospital on charges of misusing the mails. The men arrested are N. News or N. E. Wood, and Arthur C. Probert. They will have a hearing before Commissioner Humphrey in a few days, and in the meantime they have been released on bonds of $2,000. For several weeks physicians throughout the country have been receiving invitations to become members of the Christian Hospital staff. If they accepted, they were to pay from $15 to $25 for a certificate, which, it was pointed out in the circulars with the judicious exhibiting of the pocket membership card accompanying the document, "would bring more dollars annually than the cost of membership." A book, entitled "Case-Taking and Fee-Getting," was another bonus, and it was suggested the hospital would "split" the fees collected from patients sent in by the doctors who accepted membership, although this was to be "treated as confidential." The letter-heads on which this sort of invitation was sent broadcast contained the names of what was represented as the medical staff of the hospital, and at the top of the list was Dr. Murphy's name. An engraving picturing Dr. Murphy before a clinic graced the top of the page. Physicians from all points have written to Dr. Murphy about the affair. One letter, from Dallas, Texas, characterized the scheme put forward by the hospital as "the blue ribbon attempt to rob everybody and everything in sight." Inspector Stuart was appealed to, and Wood and Probert were arrested for fraud in misusing Dr. Murphy's name to obtain money. Judge Holdom was asked for the injunction against the hospital, and he issued the restraining order at once.

The Medicolegal Committee of the Chicago Medical Society has taken the matter up. On Monday, June 1, the Committee consulted their attorney, Mr. A. E. Dacy, of Pam, Calhoun & Glennon. They then saw Mr. Deneen, State's Attorney for Cook County and Inspector Stuart of the Post-office Department. Upon the advice of the Attorney, an injunction was issued restraining the Christian Hospital from using Dr. Murphy's name.

The history of St. Luke's Hospital, of Niles, Michigan, is doubtless familiar to many readers of the MEDICAL NEWS. That corporation was owned by Drs. Granville and Probert. The Medicolegal Committee of the Chicago Medical Society has in its possession proof that Probert has served a term in the Wisconsin Penitentiary. Granville has indulged in various whimsicalities. The Chicago *Record-Herald* for 1899 contains a telegram from New Carlisle, Indiana, announcing his arrest for bigamy, specifying five wives. It will be remembered that they made unwarranted use of the name of Dr. Nicholas Senn, of this city. In their dental department, they used the name of Dr. E. C. Kinsman, of Cambridge, Mass. That this was without authority is shown by affidavits, copies of which are in the possession of the committee. In 1901, Michigan became uncomfortable for this institution. In 1893, the Secretary of State incorporated the "Chicago Store" for general merchandise purposes. In 1901, this charter was purchased by Drs. Wood and others, and the name and purpose changed so as to allow of a hospital and dispensary. In 1903, the name was changed to "The Christian Hospital." It will be noticed that when St. Luke's faded in Michigan, in 1901, this one appeared here.

The reading matter and the general business policy of the institutions are identical. Nearly every name found on the Christian Hospital staff was a member of the St. Luke's staff, or has appeared in some connection with St. Luke's in the past. Even the most obtuse can see that the guiding spirit of the two institutions is the same.

The postal authorities have letters from at least six physicians stating that they purchased certificates by reason of Dr. Murphy's name. The committee urges every man, who has purchased a certificate with this understanding, to do his duty as a physician and as a citizen by writing Inspector Ketcham. The profession will be kept posted as to later developments. The Medicolegal Committee of the Chicago Medical Society consists of Drs. Wm. A. Evans, Harold N. Moyer, and C. S. Bacon. These gentlemen will leave no stone unturned to bring the guilty parties to account.

Changes in Faculty in University of Illinois.—Dr. Andrew McDermid has been elected associate professor of obstetrics; Dr. Frank B. Earle has been transferred from the chair of obstetrics to that of pediatrics, which he shares with Dr. W. S. Christopher, and clinical pediatrics; Dr. Charles S. Bacon has been elected professor of obstetrics; Dr. Maximilian Kuznik has been made adjunct professor of anatomy, and Dr. D. Lee Shaw, professor of clinical anatomy in the Medical Department of the University of Illinois.

Graduation of a Large Class.—The largest class ever graduated from the Medical Department of the University of Illinois received diplomas from the President of the University on May 26. Of the 230 graduates, 25 were women.

GENERAL.

Yellow Fever in Mexico.—Yellow fever is prevalent in Mexico City and some foreigners have died at Yucatan.

Centralblatt für allgemeine Pathologie.—Prof. M. B. Schmidt, of Strassburg, will take the editorship of this journal, made vacant by the death of Prof. v. Kahlden.

Hospital for Consumptives in West.—Plans are on foot for the establishment of a hospital for consumptives, which will be located on a site on the boundary between Arizona and New Mexico. The hospital will care for those who are unable to pay their own expenses, and no charge will be made for service of any kind. Dr. J. C. Bancroft, formerly of Kansas City, is at work on the plans for the hospital. The plans include the making of the President of the United States Honorary President, with a Board of Directors composed of the Governors of all the States.

Florence Nightingale in Her Old Age.—Florence Nightingale, whose eighty-third birthday occurred last month, is spending her old age in Hampshire, England. She received her education in Germany, and the Empress Friedrich subsequently became one of the most ardent supporters of her ideas regarding woman's work in war time.

Oldest Physician in France.—Probably the oldest physician in France is Dr. David, who lives at Montpelier, aged 103 years. He has been seriously ill twice in his life; at seventy-three he had typhoid fever, at ninety-three pneumonia. He is an authority on diseases of the spleen.

Report on the Bubonic Plague.—The bubonic plague is increasing in India. The official British figures are as follows: In 1897 the death list was 56,000. In 1898 it was 118,000. In 1899 it was 135,000. In 1900 it dropped to 93,000. In 1901 it was 274,000, and in 1902 it was 577,000, making the deadly total for six years of 1,253,000 souls. But that is not all. During the three first months of the present year the total of deaths from the plague is 331,000, or more deaths in three months from that disease than there were in the entire year of 1901. At the present rate, the "black death" promises to reap a rich harvest this year. According to English accounts, the Yersin serum has proved to be worthless, but, according to French and German accounts, it was condemned by the British authorities in India without a trial.

Removal of Chinatown.—The State Board of Health, of California, recently passed resolutions recommending the removal of "Chinatown" from its present location in the heart of San Francisco. The board asserts that the presence of "a large alien and unassimilable population is a constant menace to the health, commerce and industries, not only of the city itself, but also of the State and even the nation at large." Just how the removal is to be effected has not yet been announced, but doubtless some way will be suggested. In Honolulu the Chinese quarter became unsanitary and otherwise objectionable, and very heroic measures were taken to cleanse the disease-breeding locality. It was purified with fire. Probably the torch could not safely be employed in ridding San Francisco of its pest-hole, but until the dozen blocks are absolutely obliterated and the ground which is now saturated with filth, be given liberal treatment with chloride of lime and carbolic acid, the quarter will require close watching. Work of the right sort has been done and is being prosecuted by the Federal, State and city health officers acting in harmony, and Chinatown is just now cleaner than it ever was before. That is saying a great deal, but the disinfection must be continued, in fact be constant, in order to render the quarter safe.

The Opium Traffic.—The *Evening Post*, with its usual good sense, editorially comments on this traffic as follows: "One more ground of national complacency has our Philippine adventure now compelled us to abandon. We are about to legalize the opium traffic in our new islands. Yet for two generations at least has England's complicity with the opium trade in India and China been the occasion of moral flings at her by Americans. Missionary meetings have alternately wept over her and denounced her; the implacable Anglophobe has always had one last resort—England's shame in seeking revenue from the victims of a baleful drug habit! Have we not all been called upon to thrill with indignation at the infamy of the 'opium war,' waged by a Christian nation in order to compel China to admit Indian opium? We would listen to no excuses. Talk not to us about fixed native habits. We were not to be caught by mumblings about regulating a vice which could not be suppressed. But, alas, our proud Imperialism has now forced us to swallow all those brave words. We are to sell the opium monopoly of the Philippines to the highest bidder, and expect to get $100,000 a year out of the deadly traffic. But we still go the English one better in the matter of hypocrisy, for we hasten to announce that we are going to devote the money to 'the work of education.' One part of that education might well consist in teaching the Filipinos from what a past we have fallen away."

Once Again the "Fish" Theory of Leprosy.—Dr. Jonathan Hutchinson writes another letter to the London *Times* to reassure the timid. All sound fish, fresh or cured, is, he says, perfectly wholesome. It is only after decomposition has set in that it is dangerous. Long ago he expressed the conviction that Roman Christianity, with its frequent fast days, was responsible for the presence of leprosy in Europe in the Middle Ages. History, he says, is repeating itself now in India. Wherever Roman Catholic missions are successful there is increase of leprosy. His figures indicate that a convert from Hinduism to Roman Catholicism incurs an enormously increased risk of becoming a leper. In most of the Indian asylums "native Christians" abound, of whom by far the larger proportion are Catholics. Conversion to any form of Christianity involves risk, because it removes the prejudice against animal food, but a creed which imposes the frequent use of fish is infinitely more dangerous. His calculation is that the risk to a Catholic convert is twentyfold that of one who remains in the Hindu faith, and in some cases ninetyfold. Respecting the Chota Nagpur district of Bengal, the census compiler writes: "The great center of Roman Catholic missionary enterprise in this province is Ranchi, where its converts exceed 54,000, or about three-fifths of the total number in the province. The increase during the last decennium was 15 per cent." Now it is in precisely this district, Dr. Hutchinson points out, that leprosy also has increased (from 4.5 to 5.8 per 10,000), while in all the adjacent districts it has diminished. He then writes: "The average incidence of leprosy in India as a whole is less than five per 10,000; but there are three local communities—Minicoy, Salsette Christian, and Kaligoan—in which it attains the frightful prevalence of 150, 50, and 500 per 10,000, and these are all places where the inhabitants live by fishing." All of which well illustrates the fact that theories like trouble can be easily found if one is looking for them.

Health Officers in Council.—The first annual conference of the State and National public health officers, for which a call was recently issued by Surgeon General Wyman, in accordance with the provisions of an act of Congress approved July 1, 1902, met at the New Willard Hotel last week. The boards of health of various States were represented. This being the first of

these annual conferences the representation of twenty-one States and the District of Columbia was very gratifying to the surgeon general, who has taken a great personal interest in the success of the movement.

The conference was presided over by General Wyman, and after the meeting was called to order Assistant Secretary of the Treasury Armstrong, on behalf of the government, welcomed the delegates and assured them that everything would be done to make their stay as pleasant and profitable as possible. He said that in the great work of improving the health conditions of the country coöperation between the States and between the States and nation was the secret of success, and he promised in the name of the national government to do everything to further this end.

Surgeon General Wyman, in his opening address, outlined the purposes of the conference and what it is hoped it will accomplish. He said the great end in view was closer association and union of effort between State and national health authorities. He then briefly described the system and workings of the United States public health and marine hospital service and suggested a plan of organization by which the work of the national and State health administrations might be coordinated and made more effective.

Dr. Foster, of California, gave a description of quarantine operations in that State, particularly in relation to the plague danger in San Francisco. He said that with the vigorous cleaning out of Chinatown the fear of another attack of this disease was rapidly disappearing. He attributed the success achieved to the hearty coöperation existing between the city, State and national health officers in endeavoring to stamp out the infection. Dr. Foster was followed in interesting talks by Drs. Townsend, Porter, Egan, Conniff, Bailey, Souchon, Young, Fulton, Baker and Woodward.

At the suggestion of Dr. J. Y. Porter, of Florida, a telegram was addressed to the Florida legislature expressing the hope of the conference that the act now pending before that body providing for the collection of vital statistics would receive favorable action.

At the afternoon session the discussion of local health and quarantine conditions was continued, each representative explaining the sanitary laws and the method of carrying them out in his particular state, addresses being made by Drs. Wesbrook, Hunter, McAlester, Probst, Smith, Lee, Swarts, Simons, Tabor and Cooper.

The Conference adopted the following resolutions:

Whereas, the Conference of the State Boards of Health of the United States with the Public Health and Marine Hospital Service, having confidence in the earnest efforts and ability of the Governor and State Board of Health of the State of California acting in harmony with the Bureau of Public Health and Marine Hospital Service to thoroughly eradicate bubonic plague heretofore existing in the City of San Francisco, do resolve that in the judgment of this Conference, so long as the present effective work is continued, there is no need for quarantine restrictions of travel or traffic to or from that State.

Resolved, that the methods of cooperation between national and State health authorities suggested by the presiding officer, meets the approval of the Conference.

A committee was also appointed to draft a resolution expressing regret at the death of Dr. Mathew Gardner, late President of the State Board of Health.

The various States were represented by the following delegates: California, Dr. N. K. Foster; Connecticut, Dr. J. H. Townsend; Delaware, Dr. E. W. Cooper and Dr. Alex. Lowber; Florida, Dr. J. Y. Porter; Illinois, Dr. J. A. Egan; Iowa, Dr. R. E. Conniff; Kentucky, Dr. William Bailey; Louisiana, Dr. Edmond Souchon; Maine, Dr. A. G. Young; Maryland, Dr. J. S. Fulton; Michigan, Dr. H. B. Baker; Minnesota, Dr. F. F. Wesbrook; Mississippi, Dr. J. F. Hunter; Missouri, Dr. A. W. McAlester; Ohio, Dr. C. O. Probst; Oregon, Dr. Andrew C. Smith; Pennsylvania, Dr. Benjamin Lee; Rhode Island, Dr. G. T. Swarts; South Carolina, Dr. T. Grange Simons; Texas, Dr. George R. Tabor; Utah, Dr. T. B. Beatty; West Virginia, Dr. Samuel F. Myers; District of Columbia, Dr. William C. Woodward.

Against Use of Phosphorus.—The international chemical congress at its session June 6 adopted a resolution favoring an international agreement prohibiting the use of phosphorus in making matches and requesting the international committee appointed at Paris in 1900 to communicate the resolution to the various cabinets.

New Device for Providing Aseptic Thermometers.—The Wood Coverette is the name of a new device for covering the bulb of a clinical thermometer. It is made of thin wood, rendered impervious to moisture and does not interfere with the registering. Its advantages are that a coverette can be slipped over the end of the thermometer before taking the temperature and then it may be burned up. The cheapness of the device and its efficiency render it a most desirable contrivance.

Obituary.—Dr. A. T. Tagert, president of the Kedzie Hospital in Chicago since its foundation three years ago, and one of the best known surgeons in the country, died this week of pneumonia in Chicago. He was fifty-seven years old and had been a practising physician for thirty years. He was a member of many medical societies.

CORRESPONDENCE.

TRANSACTIONS OF FOREIGN SOCIETIES.

German.

CONGENITAL FUNCTIONAL DERANGEMENTS OF THE DIGESTIVE APPARATUS—CONGENITAL ATRESIA OF THE INTESTINES, CAUSED BY INTUSSUSCEPTION—FOREIGN BODY IN THE HEART—INFECTIOUSNESS OF GUMMA.

J. KNOPF, at the Physicians' Society of Nürnberg, Feb. 5, 1903, read a paper on the subject of Congenital Functional Derangements of the Digestive Apparatus. In 1879 and 1885 Meier and Landerer published notes on the subject of pyloric stenosis, founded upon 31 autopsies. Knopf, however, does not regard the condition as necessarily congenital for the reason that out of the autopsy material used by the other two observers, only two cases were outside of the age-range of ten to twenty years. There is lacking proof whether, as a matter of fact, younger children and even infants may suffer from hypertrophy of the pylorus, and if this is true, whether the disease may be borne at all in the manner observed in individuals of greater age. Hirschsprung, in 1888, presented definite observations for the first time in medical literature of hypertrophy of the pylorus in nurslings. His results were confirmed later by Grau, Henschel, Finkelstein and Heubner. The interest possessed by this aberration of development has had, as one result, the discovery that the disease appears in children of other ages. The stenotic conditions, although they may be observed in nurslings, have the peculiarity that they do not appear immediately after birth, but rather after the lapse of a few months. The average shown in twenty cases was often between four and five months; up to this outcome the nutritional condition of the child had been satisfactory. Of these cases 61.53 per cent. died at the end of about forty days. If the conditions shown at the autopsy as

to changes about the pylorus had existed since birth itself, it is likely that the symptoms thereof would also have dated from the same time. Since this is not the case, it is likely that some other factor has been added with the tendency of also inserting obstacles to the emptying of the stomach of its contents. One factor would supposedly be a catarrhal swelling of the mucous membrane of the stomach. The relation would thus be disturbed between the muscles of the stomach itself on one hand, and the pylorus itself on the other hand, followed finally by morbid contracture of the latter. In the autopsies the abnormal amount of pyloric muscle tissue has usually been assigned as the primary cause of the stenosis and as the anatomical basis for all the subsequent pathology and symptoms. This observation, however, has been questioned by the experiments and studies of Pfaundler. According to him it is not easy to draw direct comparisons between findings at autopsies and the conditions of the tissues during life. There are, as is known concerning the heart, both the systolic and diastolic conditions after death, and probably the arrangement of the pylorus may perfectly well be regarded as a persistent contracture of the muscles, brought about by fixation in the normal, functional phase of the stomach at the moment of death. On account of the results of these observations, Pfaundler is an opponent of surgical interference in these children. If there are marked clinical conditions which are to be explained only by the presence of the stenosis in this region of the stomach, he thinks that it is still possible by lavage and the local use of neurotic sedatives, hot baths and wrapping in hot blankets to overcome the difficulties. Similar observations have been made by Heubner, Kopven and Norden. This opposition against an operation which in its essence is life-saving, has really only its warrant in the premises that the anatomical basis of the trouble in children will usually disappear of itself. With this supposition, however, it is not possible to bring the clinical observations into unison in so far that both through palpation and through operation is it possible during life to appreciate the anatomical cause to be the masses of muscle about the pylorus, that usually are withholding the function of the stomach. The indication for an operation, which must necessarily be a laparotomy, lies in the presence of a tumor, of gastrectasia and of insufficiency of the stomach, but, after all, it rests upon great difficulties on account of the anatomical conditions of children. In such cases the clinical symptoms must be distinct and the dangers to life manifest. The good results of many operations attempted appear to warrant operative treatment.

CHIARI, at the Society of German Physicians in Prague, Feb. 20, 1903, presented a discussion on the subject of Congenital Atresia of the Intestines, caused by intussusception, which was, for the first time in medicine, discussed in 1888. Since that time three other cases have been observed of congenital atresia at the junction of the jejunum with the ileum, which, notwithstanding all care in the macroscopic examination, could not be distinguished from intussusceptions, so that the supposition was advanced that there had been an intra-uterine intussusception, which had healed of itself. Such would account for a great number of congenital atresias of the intestine. Braun has recently reported a case of congenital atresia, situated about 10 cm. above the ileocecal valve. In the distal portion of this atresia a microscopical examination showed conditions which pointed strongly toward there having previously existed a necrotic condition which probably depended upon an intussusception. With these findings Chiara agreed with the observations made in the three cases already alluded to, of which he made one microscopical examination. It was an atresia of the ileum 15 cm. above the ileocecal valve. A transverse section just below the point of stenosis proved that there had been an intussusception. The other cases, each about 4 cm. above the same valve, showed an obliteration of the ileum beneath the atresia, which was beyond doubt a remnant of a previous intussusception. Only in the third case was there a double atresia of the jejunum, one at the lower end of the jejunum, and the other about 34 cm. distal to this point was meconium recognizable with the microscope in the bowel. Nevertheless, a positive result in the cases reported by Braun shows the value of his observation.

MAX KOCH, at the Medical Society in Berlin, March 25, 1903, presented a case of foreign body in the heart, consisting of an iron pin sticking fast in the interventricular septum, and emerging free into the left ventricle. It was fixed in the septum and duly surrounded by fibrous connective tissue. During life it probably did not reach directly into the ventricle but remained among the trabeculæ, which had been bound by fibrous tissue in the neighborhood. The fact that the connective tissue was hard, and that there was nowhere any granulation tissue or cells which appear about foreign bodies recently in situ, showed that it was a very old process. In order to preserve the specimen, its position was not laid bare, but its presence was proved by the X-ray. Through this medium it was found that it was 3 cm. long, 1.75 mm. thick, an instrument blunt at the end, which projected into the ventricle, and was somewhat similar to the blade of an awl. The history was entirely negative, except that the man had formerly been a turner, and for several years had suffered from cough and expectoration, and since 1902 with palpation of the heart and shortness of breath. Clinically, he was shown to suffer from extensive arterial scleroses, systolic murmurs of the heart, and a very bad arhythmia. As to the manner in which this instrument entered the heart, the history was lacking. The autopsy itself failed to reveal a path from either the esophagus, the stomach or the surface of the body. The author was of the opinion that the pin had served as a projectile from some firearm, and quoted a Russian authority as to a similar observation.

DELBANCO, at the Biological Section of the Physician's Society in Hamburg, March 17, 1903, reported a case which illustrates the infectiousness of gumma. The patient was forty-six years old, and during his thirty-second year had acquired the primary lesion, and had been treated at a hospital in Hamburg for four weeks by inunctions. Since then he has been without symptoms and treatment. In July, 1902, after a long voyage on business he returned with a tumor of the penis, which did not prevent coitus. At the end of August his wife began to present symptoms, namely, roseola and papules about the genitals, and pustules on the face, anemia and headache. The husband, on the other hand, showed an ulcerating gumma where the tumor had been, namely, just at the meatus, and a second gumma which had developed at the peno-scrotal juncture. The case, in the opinion of Delbanco, proved emphatically that the infection was caused through these gummata. Ulcerating papules or a primary lesion in the sense of reinfection are both to be ruled out. Similar cases have very rarely been reported in literature. In those furnished by Fournier in 1875, Landouzy in 1889, Ehlers in 1894, the gummata was situated similarly as in the present case. At the International Congress held in Paris, Feulard, in a contribution upon the persistence of the infectiousness of gummata, brought together a rather large number of cases where infection had followed 6, 8, 10 and 14 years after the primary lesion. Among these cases,

however, only those of Fournier and Landouzy showed late syphilitic symptoms. With the exception of these cases, the infection of syphilis from the late cases is very rare. The possibility, however, of such results has been recognized by various authorities of high class, such as Jadassohn and others.

CHEAP THERMOMETERS.

To the Editor of the MEDICAL NEWS:

DEAR SIR: In your issue of February 28 there appeared an editorial on the "Vice of Cheap Thermometers," which is very timely and interested me greatly. About two years ago I called the attention of one of our medical journals to the fact that the certificates, furnished with the cheap clinical thermometers, were absolutely worthless. By numerous comparisons of thermometers of different makes it was proven that about 20 per cent. of the number were near enough correct to be of any use for making temperature observations. The other 80 per cent. had errors varying from 0.5° to 2.5° F. The editor of the journal, to further make sure that such errors did exist, had the same thermometers tested by one of our scientific men, who found exactly the same errors, but for some reason the journal did not wish to take up the matter and publish it and prove my assertions to our medical profession correct.

I therefore beg to extend to you my thanks for the article in your issue of February 28, not only for proving my investigations in this field to be of value, but also for the good that will result to the poor suffering patients, who have been subjected to the evils of criminal and mercenary negligence.

Respectfully yours,

Philadelphia, June 6. A. F. WATCH.

SOCIETY PROCEEDINGS.

PHILADELPHIA OBSTETRICAL SOCIETY.

(Concluded from Page 1104.)

Dr. H. D. Beyea said that he would like to ask Dr. Hammond to what extent and how the water used in this operation was sterilized. In a plastic operation, cervix and perineum, performed by Dr. Penrose in a private house a few years ago, tetanus developed and resulted in death. The nurse in attendance, not accustomed to prepare for such an operation, it was found had not properly prepared the water. It had been taken from a well after a storm and was muddy. This was observed when it was too late to resterilize the water and therefore mercuric chloride was added. There semed to be no question of doubt but that the water was the source of infection in this case. Shortly afterward there occurred at the University Maternity two or three cases of tetanus with the same result. It was discovered that the water used for douching was taken from the tap and prepared by adding mercuric chloride. The infection here was positively traced to the water. It would seem to me that since the tetanus bacillus is so frequently found in water, that unless the water is sterilized by fractional sterilization, boiled for at least two hours on two consecutive days, or sterilized in the Sprague-Schuyler sterilizer under fifteen pounds pressure, we should look to the water as the probable source of infection. Aside from catgut, it is practically the only source of infection in abdominal technic.

Dr. B. C. Hirst remarked that the cases that occurred in the University Maternity were three in number and all due to the water of intrauterine douches, he feels sure. They had at that time a resident physician who conceived the idea that every woman's womb must be washed out after labor. Every unfortunate woman had an intra-uterine douche whether there were any complications or not, and three died of tetanus. We had the water examined after the first case, and in the sediment collected from the tap water there were demonstrated the bacilli of malignant edema and of tetanus. Animals injected with the bacilli died, some of malignant edema and some of tetanus. They had boiled the water, but immediately installed a Sprague-Schuyler sterilizer, the first, he believes, in the University Hospital.

It is a curious fact that the mistake should be made so often of mistaking tetanus for hysteria. He has seen three cases in which this mistake was made at different times, in different localities and each by a different consultant.

Dr. Hammond in closing the discussion, said he took advantage of the suggestion by Dr. Sailer as to the prevention of any subsequent cases of tetanus by first cleansing the entire institution with 1 to 500 bibichloride solution and liberated two tanks of oxygen in each room with the hope that pure air might contribute something toward preventing such condition. He neved had a case of tetanus before. In the same week there were four major operations in the same institution, and the water that was used was first filtered and then boiled 18 minutes. So, it seemed to him improbable that the infection was in the water. If so, they would have heard something more from it in the other cases, all of whom were prepared in precisely the same way both as regards the water and the instruments. The case directed itself so clearly toward the teeth as the focus that he has learned the lesson that whenever he has a patient from the country districts the first thing he expects to do, and for which he shall accuse himself of negligence if he does not do, is to inspect the teeth, having any carious teeth looked after before operation. In answer to Dr. Beyea's question, I can but repeat that it seems highly improbable that the germ was in the water. He does not think in this case that there was any possibility of mistaking the diagnosis for that of hysteria. Hysteria never entered his mind. The lectures he heard when a student so impressed him, especially in regard to the peculiar expression (risus sardonicus) that from the appearance of this in his patient he felt no doubt as to the diagnosis.

Birth Palsies.—Dr. M. H. Bochroch said that the obstetrician does not always take into consideration the accidents to the child which so frequently eventuate in serious and permanent palsies. These injuries are not always evident at birth; very frequently they do not receive attention until years after, and then at the hands of a neurologist whose function is usually limited to making the diagnosis of a permanent and hopeless lesion. Birth palsies occur more frequently in the practice of the general practitioner than in the hospitals and wards attended by professional obstetricians. In brain lesions, such as hemiplegias, microcephaly, parencephaly and hydrocephalus, forceps are as a rule used too late rather than too soon; that prolonged pressure such as occurs in primiparæ, is more often the cause of this deplorable state than the improper use of the forceps. In cases of cerebral hemiplegia or cerebral diplegia the most that can be accomplished is a tedious and only partially successful attempt at education, and some training of the paralyzed limbs. It would seem that if in every child in whom at birth there are present symptoms of asphyxiation following dystocia and in whom there has been prolonged pressure and constric-

tion of the head, it would be a justifiable procedure to rapidly make an opening of moderate size upon either side of the parietal region; by such a procedure the effused blood escapes, or could be washed out with a normal salt solution. Erb's palsy is detailed, stress being laid upon the avoidance of the various procedures which predispose to this condition. The treatment of brachial palsy resolves itself into the employment of massage and electricity. The paralyzed arm should not be allowed to hang helplessly by the side, but should be supported in a sling or in a Velpeau bandage. In some of these cases nerve suturing may be indicated.

Dr. George M. Boyd in discussing the foregoing subject, said he had been fortunate enough not to meet with any of the palsies seen as the result of difficult forceps operation. He had never met with a case of brachial palsy. Bochroch speaks of prolonged labor superinducing the palsies rather than the labor assisted by forceps and interference. It seemed to Dr. Boyd that very many of the injuries that are met with, and possibly the greater number of asphyxias and fetal deaths, are due to too early interference, injudicious or faulty use of the forceps.

Dr. Stricker Coles said he had been so unfortunate as to have one case of palsy of the arm in difficult labor. The shoulders were very difficult to deliver and twenty minutes were used in making traction. He thought at one time he would not be able to deliver them at all. It was a typical case of palsy, as described by Dr. Bochroch. He heard occasionally from the child, and at one time it was said that she was at the Polyclinic Hospital where it was thought to make an X-ray picture, thinking the palsy was due to displacement. This was refused, and the last heard of the patient was that she had diphtheria and died.

The only other form he had known of is facial paralysis occipitoposterior delivery with forceps. The paralysis disappeared in five or six days and he had seen no bad results following the paralysis.

Dr. L. J. Hammond said he had been very much interested in the surgical treatment of peripheral nerve injuries and his feeling is that in this unfortunate condition they have a lesion justifying surgical treatment. As Dr. Bochroch has said, they have the condition due either to extravasation of blood from rupture of the venous plexus which surrounds the cord (extradurally), or we have inflammatory lymph deposited within the sheath itself. If this be correct it seems to me that we have in operation a relief that should be undertaken in cases that do not respond to the routine medical treatment within a reasonable period. If operation is delayed until nutritive changes take place it is probable that nothing can be done.

Dr. W. S. Stewart said that he would like to call the attention of the society to another form of palsy which they might find on investigation. He presumed that most of the members of this Society did not believe in maternal impressions. He had had in his experience a case resembling that described by the reader of the paper, but which he could trace back to maternal impressions. The child's left arm was paralyzed and hung at its side. The mother was disposed to accuse me of injuring it in her delivery. Professor D. Hayes Agnew was consulted and said that there was nothing to indicate that the child had been injured in delivery. Dr. Stewart inquired of the mother whether she had been disturbed in any manner by seeing a person with a similar condition. She at first said no. Then she replied, except that a man had sat opposite her at table who had no use of one arm. He told her he believed that to be the cause of the child's condition, and that it would be well to try electricity. He did not believe the condition would ever improve. That child, unfortunately, did not die, as in the case mentioned, and is living to-day with the same condition unhelped by various treatments and numerous doctors. He had another case which occurred with a woman sitting opposite a man who had a glass eye. When her child was born it had a corresponding sightless eye. In another case a pregnant mother gave birth to a child that had constant movements similar to chorea, and he learned that the mother, while carrying the child, was riding in a street car with a woman whose child was choreic. He could give you many other cases, without doubt results of maternal impressions. While this Society may not feel much interest in this subject, he thinks it is often well to trace back such occurrences to their true source.

Dr. E. P. Bernardy said there is no doubt that a prolonged labor can cause serious brain lesions to the new-born child, the excessive overlapping of the parietal bones causing rupture of the blood vessels and injuring the delicate coverings of the brain, but the true cause of many brain lesions, especially those of late appearance, are caused mostly by the injuries caused by misapplied forceps. While the forceps are all for saving, both to mother and child, it is a well-known fact that they can become the reverse. In an experience of nearly five thousand confinements, he can hardly recall a case injured by a prolonged labor, where forceps were not applied. In his earlier obstetrical practice the application of forceps was one in about five cases. At the present it is one in about fifty or a hundred confinements. In an article which he published on the Use and Abuse of the Obstetrical Forceps, the statistics showed that in America the forceps was applied in every fifteen confinements, therefore he cannot believe that these injuries are produced from lack of the use of the forceps.

Dr. F. C. Hammond said regarding Duchenne's paralysis, the experiments of Stolper conclusively prove that the plexus cannot be compressed by the tips of the forceps so long as the child presents by the vertex, although it may occur in face and brow presentations. Dr. F. X. Dercum states that he has never seen a case of palsy cerebral in origin occur in a multipara. From the standpoint of prophylaxis it would be well to apply forceps, just so soon as the fetal head fails to recede between pains.

Dr. Bochroch, in closing the discussion, said regarding F. C. Hammond's remarks, that he could not go into the details concerning in what particular presentation the forceps do the most damage. It is well to remember Erb's point high up on the neck, the site of the origin of brachial palsy, and that if the forceps lay over too far palsies may be made in that way. In some literature it is shown that the sole cause of palsies is that the forceps are put on in a bungling fashion, pressing on Erb's point. It is a very curious fact that facial palsies usually disappear in two or three days. He mentioned in his paper that nerve suturing might be resorted to. He is not familiar with a case in which it has been done. Nerve suturing is receiving considerable attention from the surgeons and they will have to decide the question of the utility of this operation. Recent reports by Kennedy are reassuring.

He thinks Dr. Bernardy did not understand how he tried to make clear that it was the want of proper use of the forceps rather than the early use which caused injuries. The fact that the forceps are not used early enough and prolonged pressure permitted, especially in primiparæ, is, he thinks, the frequent cause of the palsies encountered.

NEW YORK PATHOLOGICAL SOCIETY.

Stated Meeting, April 8, 1903.

James Ewing, M.D., in the Chair.

Quantitative Estimation of Albumin in the Urine.—Dr. N. E. Ditman read a preliminary report on this subject, giving especial attention to the method of Wassilyew. The MEDICAL NEWS will publish this paper in detail later.

Dr. F. C. Wood said that he thought the method which Dr. Ditman had just described promised to be an excellent one. Wassilyew's paper had been practically buried in the Russian journals and the method had never been much used. The whole technic, however, was so simple and the results so accurate that he thought it an excellent clinical method for the determination of albumin. No care was required in neutralizing the urine and in two or three minutes a determination could be obtained. Dr. Ditman would pursue the matter further, especially with the urines containing higher albumoses in order to see how much these albumoses influence the reactions, the tabulated results showing only globulins and albumins.

Dr. Harlow Brooks said that the case which he had originally reported had followed very closely the course described by Dr. Satterlee. His case, however, had died, and at autopsy the changes in the liver had been found to be very extreme, almost to be compared with the changes in acute atrophy. He thought that the disease was very badly named, since the name would imply that the disease was a definite and specific one. Although there was a great similarity in the cases spoken of by Dr. Satterlee, by no means all cases showed the same bacteria. Dr. Brooks believed that almost any bacteria were capable of producing the changes. He had noticed that there were very few cases of Weil's disease reported in American literature, probably due to the fact that there were a great many cases of acute jaundice with albuminuria and presumably with bacteriuria which were not reported at all. He had himself recently seen a case which had followed the eating of large quantities of lobster salad. Such cases usually followed the eating of contaminated meats. The more recent work on the disease had tended to confirm the idea that it was not a specific disease and was not caused by a specific bacillus; but that it might be caused by a large group of bacteria. The cases were apt to have relapses. In regard to Dr. Satterlee's having been unable to reproduce the jaundice in the experimental animals, Dr. Brooks said that he had been himself unable to do so. He thought this might be due to the fact that jaundice was rare in the animals used for experiments. He had never seen it himself, nor had he ever seen it reported.

Dr. W. H. Park asked Dr. Satterlee exactly what connection he believed to exist between the bacteria, the lesions causing the acute jaundice and the bacteriuria. Did he think the bacteria, which through their toxins excited the lesions in the region of the liver passed by the blood to the kidneys; or had there not probably been either an increase in a previous latent infection of some part of the urinary tract or the starting up of an independent infection through the influence on the body resistance of the infection causing the jaundice?

Dr. Satterlee said that so far as he could see there had been no previous disease of the kidneys. He could not say positively that there had not been bacteria there before, but he had examined the urine frequently and it had showed no signs of bacteriuria.

Dr. Park said that in this case the urine seemed to be a suitable soil for the growth of the bacteria found, since they continued present for many months after all symptoms had abated and might therefore have been present in small numbers before without having produced any noticeable changes in the urine.

A Case of Bilharzia Hematobia.—Dr. Eugene H. Pool presented a case of bilharzia hematobia, the interest of which, he said, was due, in the first place, to the infrequency with which the trouble was seen in this part of the world, and, secondly, to the interesting phenomenon which might be noted under the microscope; namely, the development of the embryo from the ovum. The patient was a young man, twenty years of age, an Algerian by birth, a sailor by occupation. When he was eight years of age he went to Ismailia on the Suez Canal, Egypt, and remained there for five years. During that time he went in swimming almost daily, both in the Suez itself, and in the neighboring streams and ponds; and he also drank the unfiltered water from the ponds. The next five years had been spent on a Greek ship in the Mediterranean. He had left this vessel two years ago at Marseilles, and there he contracted gonorrhea four days after intercourse. He had had with that attack very little pain and frequency of micturition, but had had a characteristic discharge which disappeared at the end of fifteen days under urethral injections. A fortnight later he went back to Algiers, where it was intensely hot, and shortly after reaching the country, as he supposed, on account of the intense heat, he noticed that all of his urine was diffusely red. He remained in Algiers for three or four months and the condition persisted. He had no other symptoms and was able to go about his regular occupations. As soon as he left the country the diffusely bloody urine changed to the characteristic hematuria of the disease, viz., after he had passed a normal amount of a fairly normal looking amber-colored urine and when the bladder was apparently empty, with an involuntary spasm there was discharged a dram or two of a thin bloody fluid. This condition had persisted up to the present time, intermittently. The man spent nine months in Cuba, and for the last six months had been in the United States. At the present time he also complained of indefinite pain in the loins and of a feeling of weakness which prevented him from doing any hard work. Physical examination showed a well-nourished young man. Examination of heart, lungs, abdomen, rectum, etc., was negative. The following was the report of the examination of urine: April 8, volume voided in twenty-four hours, 1,950 c.c.; reaction, acid; color, amber; sediment, moderate in amount, reddish white; sp. gr., 1,019; albumin, trace; sugar, negative; urea, 41,301 grams in 24 hours; indican, no excess; acetone, negative; chloride, 13.6 grams in 24 hours; phosphates, no excess. Examination of sediment obtained by centrifuge showed; blood, very small amount; pus, small amount; mucus, small amount; extremely few hyaline casts; numerous squamous epithelial cells; many ova of the bilharzia; and numerous structureless threads.

Examination of Blood.—Red cells, 3,340,000; hemoglobin, 86 per cent.; leucocytes, 6,600. Differential count: small lymphocytes, 31.5 per cent.; large lymphocytes, 6.5 per cent.; polymorphonuclear neutrophiles, 52.5 per cent.; eosinophiles, 9.5 per cent.

Dr. Pool also exhibited three photomicrographs; the first showed the ovum consisting of shell inclosing the embryo; the second showed the egg shell from which the embryo had migrated; and the third, the embryo after its exit from the shell. Under the microscope were shown specimens of the patient's urine containing the ova; and also diluted urine in which the development of embryos from ova was in progress.

A Simple Method of Obtaining Blood from the Rabbit.—Dr. Augustus Wadsworth demonstrated a

simple method which he used for obtaining blood from the rabbit. He said that although he had usually had little difficulty in bleeding rabbits, there were animals, especially those anemic or emaciated, which bled with great difficulty from the ear veins, yielding only a few drops at the most. His experience in bleeding rabbits had brought out the fact that there was less difficulty in summer than in winter, and on warm than on cold days, and when the animal was tilted head downward. He had therefore adopted the method of warming and tilting his animals, which brought the blood into the peripheral circulation and distended the ear veins. Anemic and emaciated animals which had proved refractory yielded under these conditions sufficient blood (five c.c. or more) for most purposes. After having tried various methods of warming his animals, Dr. Wadsworth had finally adopted the plan of putting them on a hot-water bed. An ordinary commercial rubber bag, 16 inches square, was partially filled with hot water and placed cornerwise on an animal tray. The animal, placed on the bag, was tied by its legs to the angles of the tray, and a blanket wrapped around the bag and animal increased the surface in contact with the water bag and kept in the heat. The rabbit was then ready to be tilted. A board longer than the tray, with a support behind by means of which the angle might be varied, and in front two right angle hooks screwed about six inches from the bottom of the board to hold the tray, served this purpose very well. The ear, previously shaved and sterilized with carbolic solution and alcohol, hung down below the tray and a longitudinal incision was easily made with a sharp knife in the distended marginal vein. A transverse incision was to be avoided, as it often allowed the vein to retract in its sheath and might sever the artery which accompanies the vein. A dull knife or a clumsy incision was apt to injure the walls of the vessels, so that clotting took place in the lumen of the vessels more quickly than if a clean incision were made. With this method 20 c.c., or even more, of blood might easily be drawn at one time.

Dr. James Ewing asked Dr. Wadsworth whether he had tried this method on guinea-pigs.

Dr. Wadsworth said he had not.

A Convenient Method for Growing and Storing Virulent Pneumococci.—Dr. Augustus Wadsworth called attention to the difficulty of keeping pneumococci alive and virulent for any length of time by ordinary culture methods. Any method which would do this would obviously be of great service to any one conducting a long series of experiments with this organism. Other observers had suggested various special media with which this might be accomplished. Washbourn and Eyre had used agar smeared with rabbit's blood and had found their organism alive after some months. Although Dr. Wadsworth had not made an extended study as to how long the pneumococcus might in exceptional instances remain alive and virulent under these conditions, he had frequently found such tubes sterile after a few weeks and, therefore, could not rely on this method. Bezançon and Griffon had suggested the serum of young rabbits as a favorable medium for growing and raising the virulence of the pneumococcus, but for the preservation of living cultures they had recommended the serum of older rabbits. Guarnieri had suggested a nutrient peptone meat infusion medium containing 4 per cent. gelatin and .3 per cent. to .4 per cent. agar; but the virulence was maintained for only five to fourteen days and the cultures were not viable for much longer periods. Dr. Wadsworth then described a medium which in his experience had given more certain and better results than any he had as yet tried. He had chanced, while sterilizing ascetic or pleuritic sera at low temperatures (60° to 70° C.), to obtain in one instance a soft jelly-like consistence of the serum, which still retained its original transparency. Being unable to obtain this a second time with other sera, he then tried adding small quantities of agar (.3 per cent.) to the ordinary fluid serum, and found this made a very good substitute for the transparent semi-fluid serum. The serum to be used for this medium was drawn by sterile apparatus into sterile flasks and tubed as soon as possible. This was done to avoid the usual intermittent sterilization at low temperatures which often clouded the serum and could not be relied upon to destroy the spores of some contaminating organisms, the spores often failing to develop into vegetative forms in the undiluted serum. A dilution of the tubed serum with ordinary nutrient peptone agar in the proportion of about one part of agar to five of serum gave a semifluid medium which served all practical purposes. Dr. Wadsworth said it was well to avoid using media containing glucose or other sugar which might be fermented by the pneumococcus, as rapid death and degeneration of the cells took place in such media. He had found cultures of pneumococcus in glucose broth dead after three days' incubation. Compared with the ordinary agar or serum agar tubes the advantages were obvious and numerous:—there was practically no environmental change from that found in the body fluids of the animal; the growth was less compact; the products diffused more rapidly; and finally, subcultures were easily made with the platinum loop or with capillary pipettes by means of which colonies may be transferred from any part of the tube to fresh media. In the semifluid serum the pneumococcus always grew luxuriantly along the puncture, forming colonies of considerable size, if allowed to reach its maximum growth. Microscopical preparations from such cultures showed less degeneration of the cells than on ordinary media. Furthermore, capsules were formed and were readily demonstrated by the use of gentian violet and washing with 20 per cent. copper sulphate, as recommended by Hiss (*Centralblat f. Bakt.*, 1902, Bd. XXXI, p. 302). Cultures incubated for twenty-four hours or less and placed in the ice box at from 8° to 10° C., had been found to be alive and virulent for eight or more months in the pure serum medium, and three or more months in the serum agar substitute medium. The virulence of the pneumococcus had not been accurately determined but the results of animal inoculations had been compared at an interval of three months in the case of the growth in the serum agar tubes and had failed to show any appreciable loss of virulence in one c.c. doses. Peptone broth subcultures from an agar serum tube stored for three months in the ice-box, in doses of one c.c. had killed by intrathoracic inoculations a medium-sized rabbit in about eighteen hours with the usual local and general lesions of pneumococcus infection. In view of the recent researches on bacteriolysis, and more particularly those of Walker on the increase in virulence of microorganisms when grown in the sera of specifically immunized animals, such a medium as he had shown, Dr. Wadsworth thought, might become of considerable practical service, if only the blood serum of the immunized animal be substituted for the ascitic or pleuritic fluids he had used. The organisms might thus be kept in the sera of any animal for which it had become adapted for a number of weeks with but little biological change.

Dr. W. H. Park asked Dr. Wadsworth whether he thought that the bacteria would live longer in a medium so prepared than they would if it contained more agar. He had himself used .7 per cent. agar.

Dr. Wadsworth said he thought that the advantages

of having the medium as fluid as possible were that one could get at the colonies more easily, and that it allowed growth to spread out into the medium. On pure theory he thought that if the products of the organisms were allowed to diffuse through the media, the organisms might perhaps retain their viability and virulence longer than on solid media; but he did not know what the results of experiments would show in regard to this. He thought the pure serum was preferable to the agar serum. In other tubes of pure unheated fluid serum which were kept some time and had evaporated to a semifluid consistency, the pneumococcus apparently remained alive and virulent for a considerable time as in the other tubes, though accurate observations had not been recorded. He did not know just how long the virulence might be sustained in these tubes. The less dilution the better.

Differential Leucocyte Count in the Early Days of Typhoid Fever.—Dr. Henry A. Higley of Brooklyn, New York, read a paper on this subject. After a brief review of the work done in this line by Thayer and others, he gave the results of a series of observations made during a period of two years. His results varied quite markedly from those of Thayer for the first week, and he found that in many instances there was a differential count characteristic of typhoid present during the first week of the disease. The differential counts were made from two coverglass preparations, one stained by Ehrlich's triacid stain, and the other by either Jenner's or Wright's stain. One thousand leucocytes were counted with each stain; that is, 2,000 from each patient. Sixteen cases were stained and given in detail. The counts were made during the first week, and the fact that the roseola appears on the seventh to the tenth day was used to determine the first day of the disease, the counts being made at least three days before the appearance of the eruption. The first nine of the cases gave the following average percentages: Small mononuclears, 17.8 per cent.; large mononuclears, 21.1 per cent.; polymorphonuclear neutrophiles, 59.4 per cent; eosinophiles, 1.7 per cent.

The remaining seven of the cases from a consideration of the history and the clinical symptoms were believed to have been within the first week when the leucocyte counts were made; but the writer could not demonstrate beyond a reasonable doubt that such was the case. Hence, they were not used in computing the averages. Comparing the averages obtained with those given by Thayer for the first week of the disease, Dr. Higley found the number of polymorphonuclear neutrophiles much lower (14.6 per cent.), and that of the large mononuclears much higher (8.7 per cent.). The small mononuclears and eosinophiles also showed somewhat higher figures. Other acute diseases which usually show a normal total leucocyte count or a total hypoleucocytosis and which so far as a total count is concerned are to be differentiated from typhoid, are measles, influenza, pure tubercular infection and malaria. Counts in 16 cases of malaria were given and it was found that in many instances the differential count so closely simulated that found in many cases of typhoid during the first week that a separation was impossible; but as a rule the malaria cases show a much lower relative number of eosinophiles than do the typhoid cases. Dr. Higley's conclusions were as follows: (1) Many cases of typhoid fever contrary to general supposition show the characteristic differential leucocyte count within the first week of the disease. (2) The definite value of the differential leucocyte count in the early diagnosis of typhoid fever is as yet problematical, but it seems certain that when used in addition to the total leucocyte count, more information may be obtained than by employing the total count alone.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON ORTHOPEDIC SURGERY.

Stated Meeting of March 20, 1903.

T. Halsted Myers, M.D., in the Chair.

Dr. W. R. Townsend presented the following patients:

Case I.—Female child, sixteen months of age, with a marked rotary lateral curvature to the right of the dorsal region. The mother noticed a well-marked deformity when the child was between three and four months of age, and says it has not increased rapidly. The child is well nourished and presents symptoms of rachitis—enlarged abdomen, fontanelle not perfectly closed—enlarged epiphyses and rachitic rosary.

Dr. Townsend showed a frame which is used at the Forty-second Street Hospital to keep these cases in a recumbent position, as the children are too young to permit of much being done in the way of exercise or manipulation, and the mothers cannot handle them conveniently in plaster of Paris jackets which soon become soiled.

Case II.—A boy, aged eight years, who was shown to the Section when he was two years old. At that time there was present a poliomyelitis of the muscles of the abdomen and body causing a well-marked lateral curvature to the right, as he was unable to maintain the erect position. He was under treatment ever since and has been kept flat on back. Has been given massage and passive movements in an endeavor to develop the muscles, and for past six years has worn a plaster of Paris corset. His spine is nearly straight, and is held so largely by the shape of his ribs. The power of the abdominal muscles—the recti, external and internal oblique and transversalis, has never been regained. The chest is flat and the right scapula projects very markedly. This case is interesting, as it has been followed up for a series of years. He has never had pneumonia, pleurisy or any other disease.

Case III.—A girl, aged ten years, with general rachitic deformities—lateral curvature to the right in the dorsal spine, bow legs, curvature of femur, anterior curvature of tibias—coxa veracubitus varus. Supracondylar osteotomies have been performed, and the bow legs have been corrected. For the spinal curvature solid plaster jackets have been applied and the curve is less marked to-day than it was when first seen several years ago. Reference was made to an article by Dr. Hoffman, of St. Louis, showing the normal position of the arms. The cubitus varus in this individual was very plainly shown by contrast. Dr. Hoffman has done a wedge-shaped osteotomy on the lower end of the humerus, and it might be done in this case.

Case IV.—A girl, nineteen years of age, with lower dorsal Pott's disease of one year's duration. The kyphosis is well-marked, and curvature of the spine in the affected region to the right. This case illustrates the fact that medical knowledge is needed in the application of muscular exercises for the correction of curvature of the spine. Had exercises been insisted upon instead of the application of the plaster jacket, an immense amount of harm would have been done. The treatment for Pott's disease is absolutely different from that of lateral curvature, and it is important that the difference in diagnosis be recognized.

Dr. Whitman presented these cases of typhoid spine:

Case I.—This case was treated last August in the Presbyterian Hospital for typhoid fever. The fever ran the usual course, and the patient was discharged in September as cured. It was supposed that on October 15 he fell and hurt himself. He had pain in the spine, well-marked posterior curvature and rigidity of the lumbar region. Could hardly walk. Was at the Hos-

pital for the Ruptured and Crippled for three weeks, and was told then that he had Pott's disease, early stage. Diagnosis of typhoid condition was made later. A plaster of Paris jacket was applied, worn three months and cure resulted. Of sixty or seventy of these typhoid spine cases, only six have occurred in childhood.

Case II.—This is a case of combined tendon transplantation and arthrodesis following anterior poliomyelitis. The tendon of the proprius hallucis is inserted through a hole bored in the scaphoid bone. Then arthrodesis is performed at the astragaloscaphoid point to make the effect more permanent. The operation was done last September. There is a good dorsiflexion. In many of these cases the toe cannot be raised. Here it can be.

Case III.—On July 21, 1901, this patient came to the hospital with osteomyelitis involving the knee-joint—almost rectangular flexion. Forcible correction was performed. There is now a much more useful amount of motion 10 degrees from 170 degrees to 160 degrees than before the operation was performed, when there was complete anchylosis. If found impossible to completely extend the limb, it is well to supplement the operation by osteotomy. In these cases there is a slight tendency toward flexion, which must be resisted by massage. These tendons have been divided, yet the patient has good power of flexion.

Dr. Homer Gibney presented a case of congenital lateral curvature. Nothing in the way of treatment had ever been done. The mother thinks it has grown less as the child has grown.

Dr. Virgil Gibney presented a case illustrating the difficulty of making a differential diagnosis between lumbar Pott's and osteosarcoma of the spine. In 1900, the patient presented signs of lumbar Pott's. Jackets were applied and gave relief and perfect fixation, but persistent and acute pain on the slightest provocation remained. There was loss of power in the limbs and disinclination to walk or move about. These symptoms persisted for a year. In 1901, symmetrical abscesses on either side of the spinous processes were noted. Aspiration was resorted to with negative results. The surgeon in charge declined to do laminectomy. Early in 1902 he was seen again. He then had markedly increased gibbous tumors on either side of the spine like old-fashioned saddle-bags, very hard. The patient was in a desperate condition, and taking opium. On February 8, 1902, an incision was made into the mass, and a handful or two of broken down vertebræ and grumous material taken out; no pus at all. The cavity was packed and closed. The patient was very weak—artificial respiration was used for a while. Then he was given Coley toxines.

Dr. Brooks, Pathologist, reported as follows: "Giant cell sarcoma, highly vascular, made up of fibroblasts, among which a good many plasma cells. Areas of pigmentation, probably from local hemorrhages. Probably originated from bone or periosteum. Serum treatment begun Feb. 18, 1902, and stopped May 15, 1902." The X-ray was not used, as the diagnosis proved to be correct. He now seems to be practically well.

Dr. Elliott presented a case of wasting disease for diagnosis. The patient is now three and one-half years old. There is great tenderness of the surface of the body. About six months ago Pott's disease was suspected on account of the attitude of the child, pain and partial paralysis of the lower extremities, and a plaster jacket was applied. The jacket was worn for three or four weeks with no evidence of improvement. There is now no rigidity of the spine and no deformity, but a certain amount of paralysis—drop-foot—and great tenderness about the hip-joint on both sides. Very exaggerated reflexes of both knees. There are well-marked evidences of rachitis, but that diagnosis would not explain all the symptoms—the drop-foot, continuance of pain and exaggerated reflexes. Poliomyelitis is thrown out on the ground of the exaggerated reflexes.

Dr. Halsted Myers presented the following case: E. F., four years old. Double congenital dislocation of hips. Congenital deformities of toes also. April 1, 1900, with the assistance of Dr. Schoonmaker, the right hip was reduced and put up in a spica with 40 degrees of abduction. He was soon allowed to walk with a high shoe on the opposite side. In November of the same year, a splint was applied to maintain the abduction and in December the result was considered perfect. The other hip was then reduced, with difficulty, and a spica applied with 60 degrees abduction. This, later on, was replaced by the abduction splint. In the summer of 1902, two and one-half years afterward, an abduction splint was worn again for a while on the right side, as there seemed to be some prominence of trochanter, and the boy was very wild. X-ray examination now shows both hips firmly in position. Limbs are of equal length, no limp. Normal motion, no pain. Dr. Myers stated that he had been unsuccessful in putting up both hips at once, so in this case he put up one, then the other. The time required is a little longer than by the usual method. The X-ray plate showed marked deformity of the head and neck of the right femur, and acetabulum somewhat undeveloped. The boy has now gone about a year without any protection, and may be considered cured.

Dr. Napier reported an operation for the relief of the deformity following cerebral hemiplegia. J. O., male, aged fourteen years. At seventeen months had cerebral hemiplegia, attended with convulsions; often four or five a day; lately, one or two at night. The mental powers were considerably weakened, so that an esthetic rather than a functional result was expected from an operation. The left arm and hand exhibited spastic contractures, with elbow slightly flexed; forearm pronated, hand and fingers flexed, thumb adducted—no power of supination. With considerable effort he could, by flexing the fingers, extend the hand, or extend the fingers, with the hand flexed; and distal phalanx of thumb could be extended. The left foot was held in talipes equino varus. Operation at Kings County Hospital, April 15, 1902. The attachment of the pronator radii teres was changed according to the method of Tubby. The hand and arm were held in the overcorrected position with plaster of Paris for six weeks. On removal, the arm was held naturally, but still no power of supination. In June the second step in the operation was performed. The tendons of the palmaris longus, and flexors carpi radialis and ulnaris were divided near their insertions and passed through the interosseous membrane just above the pronator quadratus. The extensor communis digitorum tendon was shortened by doubling, and the radial and ulna flexors were inserted into it and attached by treated silk suture. The tendon of the extensor secundi internodii pollicis was in the same way shortened and the palmaris tendon secured to it. The tendon of the flexor longus pollicis was then lengthened by z-shaped incision. All the suturing of tendons was done with fine silk, and after scarifying the arm was put up in plaster dressing in overcorrection. After six weeks, dressings were removed. Wounds were healed by primary union. Unfortunately the boy was taken immediately from the hospital and sent to Craig Colony before a thorough examination was made. A report from there in January, 1903, showed the arm pronated, hand extended, fingers flexed, thumb adducted. Perhaps nothing better should be expected with after-treatment neglected. Possibly even now condition might be improved with

massage, electricity and muscle education. The attempt to change the pronator radii teres into a supinator evidently failed, probably owing to adhesions. It would seem better to remove dressings at end of second or third week for careful passive manipulation. Nothing was done on the foot but a tenotomy of the tendo achillis and forcible straightening. The same principles of balancing the muscles by tendon transplantation should give beneficial results in the foot. This was done but recently, but in a five-year-old child before the stage of deformity; here a slip from the tendo achillis was used to reinforce the weak peroneus longus and brevis and half of the tibialis anticus tendon was attached to the peroneus tertius and to the periosteum over the cuboid bone. In taking the slip from the tendo achillis it might be better to take from the internal border of the tendon. In this way the remaining portion would draw more on the outer half of the os calcis, thus aiding eversion of the sole, which would be desirable. It would seem more rational to operate early in these cases before deformity has taken place, and thus hope to prevent it.

Dr. Brackett, of Boston, read a paper entitled: "Gymnastics in the Treatment of Lateral Curvature," with demonstration. He prefaced his paper by remarking that its title might lead one to believe that he advocated the treatment of lateral curvature by gymnastics. This he disclaimed, stating that the paper was a brief discussion of some principles which might be used in the treatment of lateral curvature.

Demonstration.—Two cases were furnished by the Hospital for Ruptured and Crippled, and being unused to the exercises, showed difficulties encountered by the instructor. This method of gymnastic exercises is practically indicated when, in cases beyond the ordinary light stages, it is desired to re-adjust muscular control of the individual, on the principle that in whatever position the patient exercises, that position tends to become permanent, and the more the position is corrected, the greater the ability to hold that position of correction. The first step is to look at the child and see what its faults in position are, and what changes its flexibility will allow. Place it in as nearly correct attitude as possible, then train it to take a still better position, at first by simple "stretch exercises." Tell the child to make itself tall, and an improvement in position is at once noted. Train the child to hold the spine in position, and to raise and then bring the arms back to side, and relax. Children at first try to make themselves rigid. Overcome that by telling them to raise the arms gently, at the side, and to reach with the ends of the fingers. Then place the child in a position impossible for it to take by itself. Tell it to stretch out and up and then push, getting a feeling of lift, then push it still straighter, and the position can be held for some time. The second step is to give exercises on the side plane, without moving the back. In order to do this it is well to use as heavy a dumb-bell as possible, and maintain correct position. Then give ordinary push exercises. The third step is to give exercises on the forward plane, which disturbs the position of the back. The next step is to give exercises which change the balance in standing, still maintaining the proper position of the back.

In doing this it is well to use heavy dumb-bells, five, six or seven pounds. In using these dumb-bells, however, the difficulty is that bringing them down causes a tendency toward greater sag than before. It has been avoided by having an assistant stand near to take the bells away after being raised, but that means a great deal of help. A device has been invented by the husband of one of the assistants working at the hospital—an inverted bicycle pump, fastened to the ceiling. The child grasps the handle, which is of any desired weight, and pushes it up, and then the suction of the pump greatly diminishes the weight of the handle as it comes down again. This method of applying gymnastics to cases of lateral curvature can only be used in those where it is desired, not to develop muscular strength, but muscular control. It never can be used in classes; it demands an assistant's entire time. In those cases where it has been applied it has given a good deal of satisfaction.

Dr. V. Gibney said that this line of work he had not gone into much. He thought the training and position Dr. Brackett gave, not a very desirable feature in lateral curvature, although it had been tried in classes. Some cases were benefited, others not. When not, plaster jackets, braces, etc., had been applied. He had talked with gentlemen in different cities on the subject and came home not very well satisfied with the results obtained. Dr. Brackett, however, had the reputation of being a painstaking, careful man, and the principles he had enunciated demanded respect. He believed an opportunity would be given before long of seeing further classifications taken up; Dr. Brackett had shown only one phase of the subject.

Dr. Teschner said he did not agree with Dr. Gibney that in cases of lateral curvature a certain number were benefited and a large proportion were not, but believed everything possible should be done for them. In regard to Dr. Brackett's first principle (the increase of flexibility in the spine by forcible correction whether passive or active so far as the patient is concerned, by apparatus or by the hands of an operator, or the exercise of muscular powers through the dictation of the individual patient), Dr. Teschner thought this flexibility very easily attained by proper exertion on the part of the patient. He noted that in Dr. Brackett's efforts to place the spine of child on whom he demonstrated in a proper position, her right heel was raised two inches from the floor and kept there while the spine was straight. The spine was straightened by bringing the right side of the pelvis two inches higher than normal. In regard to the weight coming down and causing sagging of the spine on the side where the deformity exists, experience had taught him that this was no danger at all. The greater the increase of curvature, the greater the flexibility of the spine. The reaction is in proportion to the intensity of the action. The patients cannot be exercised without due regard to symmetry and symmetrical action. The unequal muscles tend to become equal in length and strength, as lines on a spirited horse keep the head straight, by equal tension.

In regard to self-retention of correct position—the principle is an excellent one. It is, however, more difficult for the patient to attain than to maintain the proper position. Many of these patients are unable to mentally grasp what is required of them. When asked to do a task, it becomes necessary for them to attain a proper position before they can perform it; then they do it automatically, not with intent, and in a measure it becomes habitual and retention of the improved posture follows.

Dr. Teschner said he was opposed to forcible correction by the use of apparatus or plaster jackets, and thought more could be accomplished by rational gymnastic treatment; that it was, therefore, a waste of time to try other methods.

Dr. Brackett said that the way the children he presented did the work was not as he wanted it done—that he said before the demonstration that their faults would show difficulties to be overcome.

He agreed with what Dr. Teschner had said in regard to principles, except that a position attained by an indirect way does not help the patient to maintain the

position desired, at such time as he is not exercising. He said he was not trying to make the children strong, but able to hold themselves properly all during their waking hours, and if they are forced to think of their position there will be a continuous effort of the will, which in time will lead to permanent results.

Typhoid Spine.—Dr. Townsend quoted authorities who claimed that typhoid spine never occurred in young children. He said this was the first case he had seen under ten years of age, and it was interesting because typhoid fever itself was said never to occur in young children.

Tendon Transplantation.—Dr. Dowd said the result is much firmer when the tendon is passed through the bone in this way than where other methods are employed.

Although in this case the long extensor of the toe is divided, still the power of extension of the toe is retained.

Potts-Disease—Sarcoma.—Dr. Elliott said it was interesting to note the change in the deformity; at first annular, then saddle-bag in shape on either side of the spinous processes, then a return to the annular form.

Dr. H. Gibney saw the case when there was no deformity. A diagnosis of appendicitis had been made, and the patient had been under medical treatment for that disease. He had noted a slight angular deformity. Dr. Virgil Gibney had not spoken of the incipiency of the case when there had been no deformity.

BOOK REVIEWS.

CANCER AND OTHER TUMORS OF THE STOMACH. By SAMUEL FENWICK, M.D., F.R.C.P., Consulting Physician to the London Hospital, and W. SOLTAN FENWICK, M.D., Lond., M.R.C.P.; Senior Physician to the London Temperance Hospital; Physician to the Evelina Hospital for Sick Children. P. Blakiston's Son & Co., Philadelphia.

THE increasing interest attaching to the study of carcinoma owing to its growing prevalence lends added importance to the present volume. Representing as it does the results of the observations of two distinguished clinicians it is a contribution of the greatest value to the literature of the subject and the volume itself more than fulfils the expectations it excites. It is divided into two parts, the first of which deals with gastric carcinoma, and the second with the various other tumors of the stomach and duodenum. The wealth of material drawn upon by the writers may be appreciated when it is stated that the general description of the morbid anatomy of the malignant disease is based upon the post-mortem records of over three thousand cases, while the more special phenomena connected with its pathology are derived from an analysis of 265 cases, which were examined after death at the London Hospital and the London Temperance Hospital. The use of the same statistics has furnished interesting observations on the etiology of the disease which are somewhat at variance with the conventional views, since they show that the disease is equally common in the two sexes, and that the liability to it increases with each decade of life up to the age of eighty. A curious fact is that though the death rate from carcinoma generally is steadily increasing in all parts of the world, yet during the past four years the number of those dying of the gastric lesion in England has undergone no appreciable augmentation. Another point of interest is the seasonal difference in the occurrence of the disease, more than 60 per cent. of the deaths taking place between June and November, while the admissions to the hospital during the winter months constituted only 14 per cent. of the total number for the year. In the discussion of the question of diagnosis stress is laid on the fact that where the disease exists the sulphocyanide of potassium in the saliva tends to disappear, and the opinion is expressed that while it is at present true that we do not possess any certain means of recognizing the existence of carcinoma before it has infected the lymphatics, it is possible that in the future some chemical product of the morbid growth may be discovered in the urine or saliva which will render early diagnosis a matter of ease and certainty. A palpable tumor is said to be absent in nearly one-fifth of all cases of carcinoma of the stomach, while its presence shows that the growth has given rise either to extensive infiltration of the gastric wall or to a secondary infection of the omentum and lymphatics, and that, therefore, the disease has existed for a considerable length of time, and is too far advanced to permit of complete removal.

Of the sections on non-malignant tumors those on concretions and cysts are particularly interesting as is also the one on syphilis of the stomach.

A considerable number of excellent reproductions of photographs of specimens advantageously elucidate the text as do also the numerous interpolated case histories. Considered from the standpoint of the medical man the work is perfect, though a surgeon would wish that it had been prepared in collaboration with one of his own confrères in order to present both aspects of the subject.

PROCEEDINGS OF THE AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION at the Fifty-eighth Annual Meeting, held in Montreal, Que., June 17-20, 1902. Published by American Medico-Psychological Association, 1902.

THERE are some excellent and generally interesting articles in this volume. For instance, Dr. Stanley Abbott's article on the Criteria of Insanity and the Problems of Psychiatry deserves to be widely read. Dr. James Buckley's article on the possible influence of Rational Conversation on the Insane is another communication that deserves to have a wider circulation than that of a volume of transactions. Dr. Edward B. Lane's article, on Litigious Insanity with Report of a Case, is an informing discussion of a subject not sufficiently understood. Dr. Hattie's article on The Rôle of Education in the Development of Self-control also deserves to be more widely circulated than in the transactions of a society. As a matter of fact so many of these psychiatric questions have become of general interest now that such articles should be published in the general medical periodicals.

MANUAL OF SURGERY FOR STUDENTS AND PRACTITIONERS. By WILLIAM ROSE, M.B., B.S., Lond., F.R.C.S., Professor of Clinical Surgery in Kings College and Senior Surgeon at the Kings College Hospital, etc., and ALBERT CARLESS, M.S., Lond., F.R.C.S., Surgeon to Kings College Hospital and Teacher of Operative Surgery in Kings College, London. Fifth Edition. Wm. Wood & Co., New York.

THIS admirable text-book fulfils the claims so clearly set forth for it by its authors in their preface. It presents to the student the facts of surgical science in a concise and succinct form, with sufficient detail to prepare him for all ordinary examinations. At the same time the practitioner and his needs have not been overlooked, and the authors have endeavored to present in considerable detail the modern surgery of conditions which he is most apt to be concerned with. They have, of course, suffered in common with others from the fact that the enormous increase in surgical literature

has made it almost impossible to compress the science into a single text-book of manageable size. Their judgment was certainly good when they excluded all historical and bibliographic references as well as considerations of the surgery of the eye, ear and female genital organs. Like Mr. Treves, whose admirable little text-book is too well known to need citation, the book suffers by reason of the presence of many old and very undesirable illustrations. The minute one looks at the work, these stamp it as not of American origin. Nevertheless, there are some very excellent X-rays and the illustrations in connection with the chapter on Orthopedic Surgery are most excellent. In a future edition of this admirable work, it might be hoped that the rather grotesque outlines given on Page 888, indicating the line for incision in amputation of the breast in cancer, should be improved upon. Touching on the treatment of carcinoma of the breast, which this illustration is intended to elucidate, it would perhaps have been better if the eminent authors had omitted the division of the operative intervention into "complete" and "incomplete," inasmuch as they say in their opening lines that "to give the patient as good a chance as possible of permanent cure, the excision should be very radical."

Chapter XIII deals most interestingly and instructively with the surgery of the lymphatics, a department which heretofore has been altogether too much neglected. The book is thoroughly up-to-date in its views on the treatment of exophthalmic goiter, and the authors are to be congratulated that they have crowded into a very small space most of the facts that are known about this curious condition. Just as exception may be taken to the description of the treatment of mammary carcinomata, so objection might be made to the methods advised in treating carcinoma of the tongue. From our standpoint the authors do not take a sufficiently radical view of the necessity of removing all glands in the vicinity of a carcinomatous growth. This is illustrated by the prominence which they give to the intrabuccal method of removing portions of the tongue. They do not agree with most American surgeons who believe that the question of glandular infiltration from carcinoma probably takes place as soon as, or very shortly after, the growth is noticed by the patient or even earlier. Thus it does not seem quite modern to say as they do, that "where the jaw, floor of the mouth or glands in the neck are much implicated, an extrabuccal operation is necessary." The chapter on Injuries of Bones is excellent, but here again are to be noticed marked discrepancies from American methods and teaching. This is particularly noticeable in their consideration of fractures of the neck of the femur, which they say are commonly divided into intra- and extracapsular varieties. The treatment is outlined entirely upon the diagnosis of these special varieties. Liston's splint, as described, would seem vastly inferior to the methods of extension usually employed here. It is difficult to see any difference between it with its long side-splint and perineal pad and the methods employed here before the introduction of the Buck extension. For extracapsular fractures as well as for fractures of the upper third of the shaft, Hodgen's splint is advocated.

In conclusion, it would seem right to say that this volume, which is presented to us in admirable typographical form, should not be too critically judged by our own standards of merit. That it will fill a place in our American institutions and among our practitioners is not for a moment to be doubted, and it may be confidently expected that a succeeding edition will be even better than the present.

BOOKS RECEIVED.

The MEDICAL NEWS *acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the* MEDICAL NEWS *will shortly appear.*

WILD OATS. By M. C. Hine. 16mo. P. Blakiston's Son & Co., Philadelphia.

PROCEEDINGS OF THE NEBRASKA STATE MEDICAL SOCIETY. 1902. 8vo, 360 pages.

BURDETT'S HOSPITAL AND CHARITIES. 1903. demi 8vo, 1020 pages. Scientific Press, Ltd., London.

THE BUCKEYE DOCTOR. By W. W. Pennell, M.D. 8vo, 345 pages. The Grafton Press, New York.

BACTERIOLOGY. By F. C. Zapffe, M.D. 8vo, 350 pages. Illustrated. Lea Brothers & Co., Philadelphia and New York.

DISEASES OF THE EYE. By C. A. Veasey, M.D. 8vo, 412 pages. Illustrated. Lea Brothers & Co., Philadelphia and New York.

TUBERCULOSIS. By Norman Bridge, M.D. 8vo, 302 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia and London.

THE PRACTICAL DETAILS OF CATARACT EXTRACTION. By M. H. Herbert, M.D. 12mo, 109 pages. Illustrated. Wm. Wood & Co., New York.

MEDICAL AND SURGICAL USE OF ELECTRICITY. A. D. Rockwell, M.D. New edition. 8vo, 656 pages. Illustrated. E. B. Treat & Co., New York.

THE ERRORS OF ACCOMMODATION AND REFRACTION OF THE EYE. By Ernest Clarke, M.D. 12mo, 225 pages. Illustrated. Wm. Wood & Co., New York.

THE ROENTGEN RAY IN MEDICINE AND SURGERY. By E. H. Williams, M.D. Third edition. 8vo, 757 pages. Illustrated. The Macmillan Co., New York.

CARE OF THE BABY. By J. P. C. Griffith, M.D. Third edition. 8vo, 425 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia and London.

PRACTICAL HANDBOOK OF THE PATHOLOGY OF THE SKIN. By Dr. J. M. H. McLeod. 8vo, 408 pages. Illustrated. P. Blakiston's Son & Co., Philadelphia.

THE REFRACTION OF THE EYE AND ANOMALIES OF THE OCULAR MUSCLES. By Kenneth Kemble. 8vo, 214 pages. Illustrated. Wm. Wood & Co., New York.

PRACTICAL POINTS IN NURSING. By Emily A. M. Stoney. Third edition. 8vo, 466 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia and London.

DISEASES OF THE STOMACH. By Franz Riegel, M.D. Edited by Dr. C. G. Stockton. 8vo, 835 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia, London.

THE PRACTITIONER'S GUIDE. By Drs. J. W. Carr, T. P. Pick, A. H. G. Doran, and A. Duncan. 8vo, 1107 pages. Illustrated. Longmans, Green & Co., New York and Bombay.

MANUAL OF MEDICAL JURISPRUDENCE AND TOXICOLOGY. By Dr. H. C. Chapman. Third edition. 8vo, 329 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia and London.

SYSTEM OF PHYSIOLOGIC THERAPEUTICS. Edited by S. S. Cohen, M.D. Vol. 10. Pneumotherapy. By Dr. P. L. Tissier. 8vo, 479 pages. Illustrated. P. Blakiston's Son & Co., Philadelphia.

A TEXT-BOOK OF LEGAL MEDICINE AND TOXICOLOGY. By Drs. F. Peterson and W. S. Haines. Two volumes. Vol. I. 8vo, 730 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia and London.